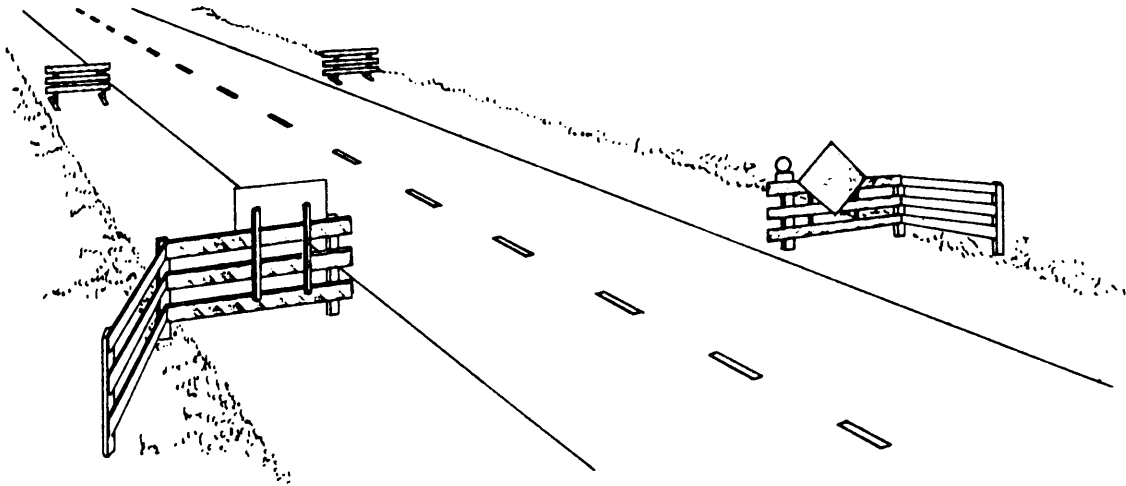


HIGHWAY COSTS AND REVENUES

The Present Dilemma



Informational Bulletin No. 139

LEGISLATIVE RESEARCH COMMISSION
Frankfort, Kentucky

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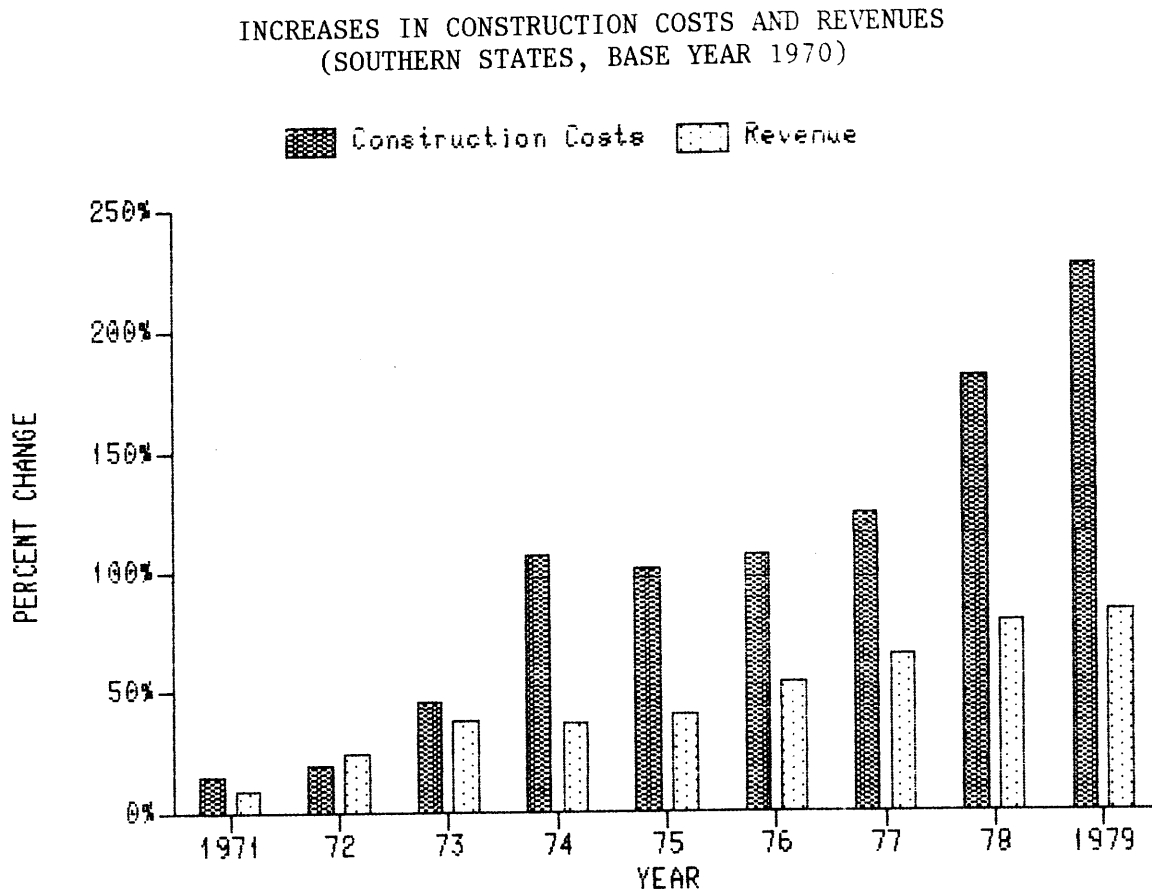
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INTRODUCTION

As we move into the decade of the 1980's, state and local governments confront an increasingly disturbing dilemma. On the one hand, the costs of their road programs are rising at a rate little short of awesome. On the other, revenues to support those programs continue their slow, straight-line increase.

The predicament is graphically illustrated below.



It is interesting to note that both rising costs and depressed revenues have a common cause--inflation of petroleum products. The petroleum products used in road construction and maintenance appear to be the chief contributing factor in the soaring costs. At the same time, the high price of motor fuels, a major source of revenue, is having a dampening effect on consumption. Recognition of this, however, is of little practical help in resolving the dilemma.

As can be seen in the Figure above, the problem has been growing for several years. It is now beginning to reach the critical stage. Because of its prevalence and seriousness, the leadership and staff of the Southern Legislative Conference recognized the need for background material which might place the problem in perspective for legislators.

Staff of the Kentucky Legislative Research Commission were asked to develop such material. This report is the result of that request.

The report is comprised of three sections. The first section is an overview of southern states' rural highway programs. It contains a review of rural road mileage, an evaluation of rural road conditions, a description of various financing methods, and a discussion of the administration of road systems. This section was developed by James Roberts and James Monsour, staff members of the Transportation Committee of the Kentucky Legislature.

The second section, developed by C. Gilmore Dutton, committee staff administrator of Kentucky's Appropriation and Revenue Committee, discusses highway revenue resources used by southern and other states. Particular attention is devoted to analysis of flat rates vs variable rates for motor fuel taxes.

The final section was developed by Robert Fallon of Kentucky's legislative budget staff. This section discusses possible means of supplementing road fund dollars and steps that may be taken to get the most out of the funds available.

I.

SOUTHERN UNITED STATES

RURAL ROAD SYSTEM

by James Roberts and James Monsour

This section will examine the southern states' rural highway programs. It includes: (1) a brief review of rural road mileage; (2) an evaluation of rural road conditions; (3) a description of rural road financing; and (4) a discussion of the administration of rural road systems.

The rural road system for the purposes of this study is defined as road mileage which lies outside the corporate limits of a municipality. Under this definition, no distinction is made between interstate highways and feeder routes between state highways. All roads beyond corporate limits which are open to public use and maintained by a government entity are considered rural.

According to the Book of the States, total U.S. road mileage in 1979 (the last date figures were available) was 3,885,452. Of this total, 3,190,797 miles were classified as rural.¹ Thus, as defined in the preceding paragraph, rural mileage encompasses 82% of the nation's road mileage.

Responsibility for maintenance of rural highway mileage resides with either individual state or local governments, or may be shared between state and local jurisdictions. Maintenance responsibility involves the upkeep of roads through resurfacing, grading, patching and making other necessary repairs. In general, the governmental entity responsible for maintenance bears the burden of the costs for any work performed.

Southern Rural Road System

The southern states contain 1,059,362 miles of rural roads, approximately 33% of the 3,190,797 total rural miles in the United States.² Table 1 lists rural mileage in each southern state:

TABLE 1*

Rural Road Mileage in Southern States

State	Total Rural Mileage
Alabama	67,740
Arkansas	63,619
Florida	70,536
Georgia	86,590

Kentucky	62,514
Louisiana	45,020
Maryland	22,530
Mississippi	60,689
North Carolina	75,858
Oklahoma	93,532
South Carolina	54,232
Tennessee	69,325
Texas	199,150
Virginia	54,246
West Virginia	33,781
<hr/>	
TOTAL	1,059,362

*Book of the States, 1980-81.

The southern region averages 70,624.6 miles of rural road per state, compared to a national average of 63,815.94 miles. However, Texas, with 199,150 miles of rural roads within its boundaries (more than any other state has), tends to positively skew the southern region. Of the top twenty states in total rural mileage, only four are in the southern region: Texas (1), Oklahoma (11), Georgia (15), and North Carolina (19). The southern state with the least rural mileage, Maryland, ranks 40th nationally, with 22,530 rural miles.

Since the federal government's involvement with maintenance is limited, the fiscal burden falls either on state or local governments. Currently, the most pressing question for government officials is who should be responsible for the maintenance of rural roads.

Classification of Rural Roads

For administrative purposes, rural roads are classified by maintenance responsibility according to three categories: roads under state control, roads under local control, and roads under federal control. Rural mileage under federal control is defined as the road mileage in federal parks, forests, or reservations that are not a part of the state or local highway systems.³ Several states have absorbed a portion of this mileage into their state or local highway system. So called Federal-Aid system roads are, basically, segments of state and local mileage eligible for federal aid.

Thus, except for minor amounts of highway mileage, primarily in federal parks and installations, practically all the roads and streets in the United States are under the jurisdiction of the states and local governments.⁴ State rural mileage is defined as that portion of the rural highway network for which the state government has maintenance responsibility. Similarly, local mileage is that for which local governments bear maintenance responsibility. Again, municipal mileage is not included in this discussion; therefore, in most cases, "local government" refers to county government.

The following tables indicate maintenance responsibility of rural mileage by state and the percent of mileage responsibility by source in each state, and they allow for national comparisons.

TABLE 2*

Maintenance Responsibility of Rural Mileage by State

State	Total Rural Miles	State Mileage	Local Mileage	Federal Mileage
Alabama	67,740	19,534	47,909	297
Arkansas	63,619	14,126	74,871	1,622
Florida	70,536	9,784	59,568	1,184
Georgia	86,590	15,799	70,791	-
Kentucky	62,514	23,828	38,374	312
Louisiana	45,020	14,708	29,768	544
Maryland	22,530	5,410	16,703	417
Mississippi	60,689	9,291	50,487	911
North Carolina	75,858	71,913	-	3,945
Oklahoma	93,532	11,715	81,783	34
South Carolina	54,232	33,646	19,988	598
Tennessee	69,325	8,300	59,890	1,135
Texas	199,150	62,451	135,690	1,009
Virginia	54,246	50,531	948	2,767
West Virginia	33,781	32,651	-	1,130
TOTAL	1,059,362	383,687	659,770	15,905

* Book of the States, 1980-81.

TABLE 3*

Percent of Rural Mileage Under State and Local Control

State	Total Rural Mileage	%State Control	%Local Control	%Federal Control
Alabama	67,740	28.83	70.72	.43
Arkansas	63,619	22.20	75.24	2.54
Florida	70,536	13.87	84.45	1.67
Georgia	86,590	18.24	81.75	0.00
Kentucky	62,514	38.11	61.38	.49
Louisiana	45,020	32.66	66.12	1.20
Maryland	22,530	24.01	74.13	1.85
Mississippi	60,689	15.30	83.18	1.50
North Carolina	75,858	94.79	0.00	5.20
Oklahoma	93,532	12.52	87.43	.03
South Carolina	54,232	62.04	36.85	1.10
Tennessee	69,325	11.97	86.39	1.63
Texas	199,150	31.35	68.13	.50
Virginia	54,246	93.15	1.74	5.10
West Virginia	33,781	96.65	0.00	3.34
TOTAL	1,059,362	36.21	62.27	1.50

* Book of the States, 1980-81.

TABLE 4*

Regional Comparison of Rural Mileage

Region	Total Rural Mileage	State Control	Local Control	Federal Control
National	3,190,797	704,421	2,255,526	230,850
Southern	1,059,369	383,687	659,770	15,905
Other	2,131,428	320,734	1,595,756	214,945

* Book of the States, 1980-81.

TABLE 5*

Percent of Rural Roads Under State and Local Control
by Region

Region	Total Rural Miles	%State Control	%Local Control	%Federal Control
National	3,190,797	22.07	70.68	7.23
Southern	1,059,369	36.21	62.27	1.50
Other	2,131,428	15.04	74.86	10.08

* Book of the States, 1980-81.

Several conclusions may be drawn from Tables 2 through 5. First is that southern states place a greater emphasis on state control of rural mileage than do states in other regions. The national average of state-maintained rural road is 22.07%. In contrast, the southern states' average of state-maintained rural roads is 36.21%. By factoring out the southern region, the state rural mileage would include 15.04% of the total rural mileage.

Second, a review of rural mileage maintenance responsibility across the U.S. reveals that only six states have a majority of rural roads under state control. In two of these states, Maine and Delaware, total road mileage and the number of county governments appear to be significant variables. Maine ranks 41st in total rural mileage and contains sixteen counties, while Delaware ranks 48th and contains only three counties. The low mileage in these two states and the limited number of counties make it possible for the state to assume total control.

The four other states with a majority of roads under state control are in the southern region and generally have more rural mileage and units of county governments than Delaware and Maine. Their ranking is as follows: North Carolina (11); Virginia (32); South Carolina (33) and West Virginia (38). Only two states, North Carolina and West Virginia, allow localities no control over the rural road system. The southern states generally, then, have assumed greater maintenance responsibility for rural road systems than the states of other regions.

Condition of Southern Roads

The escalating costs of road construction and maintenance coupled with stabilizing or declining road fund revenues are causing problems throughout the nation. The failure of revenues to keep pace with costs is contributing to deteriorating road conditions.

Several studies completed in recent years document the declining condition of roads. The Highway User Federation points out that the highway system has been declining for the last decade. To support their contention, they offer the following:

- Roads are bad.

Only a third of our major roads are rated "good" by the United States Department of Transportation.

- Bridges are falling.

One out of every five major bridges - and just about half the minor ones - are due for major repair...close to 200,000 bridges overall.

- The interstate is far from complete.

Many older segments need complete reconstruction...backlog pavement replacements have tripled in four years.

- Our roads are really not safe enough.

State DOTs and highway departments currently face \$3 1/2 billion in liability claims involving inadequate roads.⁵

Poor road conditions result, in part, from the high costs of maintenance and construction, and hence the amount of work that can be undertaken. The USDOT price construction index for the United States rose 137.9% from 1970 to 1979. Additionally, petroleum products, which are essential to construction and maintenance programs, have increased at a similar or even greater rate during this period and have been predicted to increase throughout the 1980s.

These costs have forced the state DOTs and highway departments to defer maintenance. As the gap between the monies needed and the monies available widens, necessary maintenance projects are delayed. Thus, the financial picture is further complicated by deferred maintenance, as additional construction and maintenance needs are identified each year.

The Federal Highway Administration classifies pavement conditions each year according to federal-aid highway system functional classifications. Functional classification is a means by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Functional classes describing rural roads include:

- (a) Principal arterials;
- (b) Minor arterials;
- (c) Major collectors; and
- (d) Minor collectors.⁶

Principal arterials include the interstate and other major traffic arteries. These roads are a connected rural network of continuous routes having similar characteristics. They are characterized by corridor movements having trip length and travel density indicative of substantial statewide or interstate travel, they serve virtually all urban areas of 50,000 or over population and a large majority of municipalities of 25,000 and over population, and they provide an integrated network of roads without stub connection. The principal arterials contain subclassifications of (1) interstate and (2) other principal arterials.⁷

Rural minor arterials link cities and larger towns and form an integrated network providing interstate and intercounty transportation. These roads are spaced at intervals, consistent with population density, so that all developed areas of the state are within reasonable distance of an arterial highway. The rural minor arterial roads provide service to corridors with greater trip length and travel density than those served by the collector system.⁸

The rural collector road systems serve primarily intracounty travel rather than statewide, and constitute those routes on which predominant travel distances are shorter than on arterial routes. The rural collector system is subdivided into major and minor collectors. Their characteristics are as follows:

Major Collector Roads - These roads: (1) provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, important mining and agricultural areas, etc.; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intracounty travel corridors.

Minor Collector Roads - These routes: (1) are spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector route; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.⁹

Road Conditions by Functional Classification

It is hoped that the preceding description will provide the reader with a greater understanding of roads included in the Federal Highway Administration's road categories. The description should also enable the reader to select roads in his area which could be included in these functional classifications.

In addition to developing the road classification network, the Federal Highway Administration provides an analysis of pavement conditions, wherein roads within each functional classification are given present serviceability ratings. The Rating range is 0-5, with the higher value indicating better road conditions. Pavement conditions are classified as good, fair or deteriorating. Unpaved roads are not given a rating.

For the purposes of this study, the southern states reporting to the Federal Highway Administration have been examined collectively. The number of deteriorating roads is compared to national figures. Unpaved mileage has also

been included as part of the deteriorating road mileage in this analysis.

TABLE 6*

Road Deterioration by Functional Classification

Federal-Aid Highways, 1978*

FUNCTIONAL CLASSIFICATION	REGION	
	Southern States	United States
INTERSTATE		
Total Mileage	7,889	23,724
Miles Deteriorated	381	2,205
Percent Deteriorated	4.8	9.0
OTHER PRINCIPAL ARTERIALS		
Total Mileage	22,493	63,649
Miles Deteriorated	1,046	3,733
Percent Deteriorated	4.3	5.9
MINOR ARTERIALS		
Total Mileage	35,356	114,446
Miles Deteriorated	1,308	6,177
Percent Deteriorated	3.7	5.4
MAJOR COLLECTORS		
Total Mileage	122,149	342,791
Miles Deteriorated	14,687	71,931
Percent Deteriorated	12.0	21.0
MINOR COLLECTORS		
Total Mileage	73,280	240,565
Miles Deteriorated	16,352	118,861
Percent Deteriorated	22.3	49.4

*Highway Statistics, 1979.

The number of miles deteriorated and the percent deteriorated in the major and minor collector classifications are inflated because of the amount of unpaved miles. In the southern states, 3,082 miles of major collectors are unpaved; if these miles had been excluded from the total deteriorated miles, the percentage would have dropped to 9.5%.

Minor collectors which are unpaved accounted for 8,187 of the total deteriorated miles. Omission of this mileage from the deteriorated mileage total would reduce the percent regarded as deteriorated mileage to 11.1%. The reason for including unpaved mileage is that in the states contacted and in studies which have been reviewed, initial resurfacing programs are given a high priority.

Summarizing Table 5, it appears that the southern region is faring better than the United States as a whole. The figure establishes that the percentage of the deteriorated road mileage in the southern states is below the percentage of the deteriorated road mileage in United States. The statistics also

indicate that the minor arterial class is in better condition than the other categories; the lesser collectors appear to have the greatest percentage of deterioration.

State and Local Road Conditions

State and local governments have also been attempting in recent years to assess road conditions. Kentucky and Florida initiated Transportation Task Forces and, at the direction of their respective Governors, examined all types of transportation. Mississippi and Louisiana publish and distribute annual reports on their road construction and maintenance programs. County associations in Texas, Alabama and Kentucky have aided in completing research on local roads.

Most road condition reports done at the state and local level render similar conclusions. Roads are deteriorated at a faster rate than in previous years. The main factor in this rapid deterioration is the fact that costs are outstripping revenues by a wide margin.

Florida. The Florida Transportation Policy Study Commission released its reports in March, 1980, concluding that the condition of the state highways is alarming. The Commission cited a current need of \$1 billion to rehabilitate the system to the point that no segments are structurally or operationally deficient.¹⁰

In describing Florida's standards of road quality, the Commission explained that nationally recognized standards call for a stable traffic flow. However, Florida and other states do not establish a need for operational improvements until a highway segment approaches unstable traffic flow. Approximately 12 percent of the state highway mileage operates below the level of unstable traffic flow.¹¹

The same situation holds true for structural road conditions. Florida in recent years has decreased its level of standards for structural condition from 70 to 60. Approximately 33 percent of the state highway mileage has structural ratings below 60. In addition, more mileage each year in Florida fails to satisfy the minimum standard for traffic flow condition and the minimum standard for structural conditions.¹²

Kentucky. In 1979, a Report of the Governor's Task Force on Transportation was released with remarks similar to those of Florida. The Kentucky report called the revenue/cost predicament a crisis and attributed its causes to unresponsive road fund revenue coupled with double-digit inflation.

The Transportation Finance Subcommittee of this task force stated that without additional funding, the highway system will continue to deteriorate at a rate fifty percent greater than funds are available to maintain it. Even more important, within the next biennium there will be insufficient funds to maintain a state construction program and/or match federal funds for continuation of the Federal-Aid highway program.¹³

Cost figures developed during the course of the Task Force meeting and at the 1980 Regular Session of the General Assembly showed an identified need of \$300 million annually for the next decade. The findings of this Task Force and other information developed for the legislature in 1980 led to the passage of a nine percent variable motor fuels tax.

Assessment of Local Road Conditions

The studies completed in Kentucky and Florida related to the state-maintained system of highways. In addition to those roads, there are in most states a network of roads maintained by the counties. These roads are suffering from the same revenue/cost situation as state highways.

Local Roads in Texas. The Texas Advisory Commission on Intergovernmental Relations recently completed a study on local roads. Their findings are similar to the findings on state highways in Florida and Kentucky.

The cost of new construction in Texas has increased significantly since the start of the farm-to-market program. The average cost of construction per mile has risen from \$10,431 in 1948 to \$58,441 in 1970. Cost figures for the decade of the 1970s were also estimated to be \$121,800 or double the 1970 cost figures.¹⁴

The significance of the Texas study is that county government is responsible for much of the maintenance and construction cost in the state of Texas. (Texas' local government construction and maintenance program will be detailed later.) Local governments are also being adversely affected by the deteriorating road conditions. As state governments try to develop innovations for road construction and maintenance programs, local government must also engage in re-evaluating their policies.

General Nature of Road Fund Financing

User Tax Principle

The financing of roads at the federal level and most often at the state level is derived from the idea of taxing products used primarily on public highways. This principle of taxation is commonly referred to as the user tax.

Beginning with the first publicly constructed roads, user taxes have remained a popular method of levying taxes. Historically, public officials have perceived user charges as a method of generating large amounts of revenue for specific purposes.

In theory, user charges illustrate earmarking at its best. Since the only people who pay the charges are the consumers who use public goods or services, willingness to pay the charge implies that the consumer values the benefit at least at its "market" price. Thus, the benefit criterion for taxation is satisfied for all consumers. User charges also have the attractive feature that they offer information about the desirable level of provision of a public service, for if the revenue derived from a user charge exceeds the cost of providing the service, it is reasonable to infer that the service should be expanded.¹⁵

The motor fuels tax is often cited as an example of a user charge. The highway user pays a tax (motor fuels) the base of which is related to road use. The revenue generated eventually is used to provide additional highway services. Examples of other user fees utilized by the federal government include those levied on postal service, national park admissions and air fares.

Historically, the conventional funding mechanism used by the southern states is the user tax levied on the cost of gasoline, diesel fuel and automobile products. Presently, each of the fifteen southern states and the federal government levy user taxes to support road programs. In the member states, 4 cents per gallon in federal user taxes for gasoline and diesel fuel, plus 5 to 11 cents per gallon in state taxes, are collected at the pump. Gasohol is exempted from the federal motor fuels tax and from state taxes in Arkansas, Louisiana and Oklahoma. Maryland levies a reduced motor fuels tax on this fuel.

Additionally, the federal government collects taxes on tires, inner tubes, oil, parts and accessories, trucks and buses. A federal tax of \$3 per 1,000 pounds gross weight is levied on vehicles weighing over 26,000 pounds fully loaded, excluding buses used in local transit service. Finally, many of the southern states use driver license and vehicle registration fees as well as other road user fees, to support their respective road programs.

In most of the southern states, user tax revenues collected by the state are deposited in a Transportation Fund, from which road program allocations are made. Federal user tax revenues are deposited in a National Highway Trust Fund, then redistributed to the individual states through the Federal-Aid Highway program.

Despite the variety of federal and state taxes levied, user tax receipts alone cannot pay for construction, repair and maintenance on the 1,059,362 miles of rural roads in the South.¹⁶ As a result, supplemental funding has become a necessity in those southern states with local road programs. Counties in Arkansas, Florida, Georgia and Texas, for example, rely to some extent on ad valorem property taxes to support local road programs. Kentucky, Louisiana, Maryland and Tennessee counties utilize appropriations from local operating or general funds for this purpose.

Federal Aid for Highways

Federal assistance to the states began over sixty years ago with the establishment of the Federal-Aid Highway Program. Today, the Federal Highway Administration administers 57 different programs which together account for approximately 30% of all highway expenditures. The bulk of this money is expended on federal, state and county roads outside of municipal jurisdictions.

As mentioned earlier, the improvement of interstate and other federal-aid highways is financed from the proceeds of motor-fuel and other highway-related excise taxes deposited in the Federal Highway Trust Fund. Administered by the Federal Highway Administration, this is a grant-in-aid type of program; that is, funds for use on highway improvements are allotted to states in accordance with formulas that give weight to population, area, mileage, and--for the Interstate System--relative costs; other highway funds administered by the

Federal Highway Administration, but not financed from Trust Fund revenues, include those for Highway Beautification and the Appalachian Development Program.¹⁷

Federal assistance to the states is made on a matching basis, with 10% to 25% of the project costs required of the individual states, depending on the program. Interstate, Hazard Elimination, and Bypass Highway funds require a 10% state match, while Interstate 3R (Resurfacing, Restoration, and Rehabilitation), Primary, Secondary, and Off-System road funds require a 25% state match.

State Aid for Highways

State financing for highways is similar to the federal method, since it is based, for the most part, on the user principle. In the majority of southern states, the user fees are deposited in a Transportation or Road Fund and allocated by formula or appropriation to specific programs. In other states, such as Georgia and Louisiana, the user receipts accrue to the State General Fund and appropriations for highways are made from the state's total revenue.

The principal revenue source for highways is the motor fuels tax. This tax levy is different in each state, as well as is the method of allocating the revenue. Other user fees include motor vehicle registration fees, driver license fees, sales tax on motor vehicles and other miscellaneous receipts.

As of 1979, the statutes of 48 states provided for the sharing of state collected funds, chiefly highway-user tax revenues, with local governments for road and street purposes. This assistance is in the form of direct grants-in-aid and shared revenue. The two states lacking such statutes are Alaska and West Virginia.¹⁸

In describing the revenue and allocation systems of any state, the road fund is often referred to as a dedicated or non-dedicated fund. The dedicated fund requires that all user fees generated be returned to the roads either by new construction or maintenance. The non-dedicated fund allows the highway department to spend some of its highway user fees for purposes other than road programs.

West Virginia dedicates its entire motor fuels tax to the administration, construction and maintenance of highways. This example depicts a pure form of the application of the user principle of taxation. All taxes paid by motor fuel users are being applied toward roads.

The following table describes the West Virginia method of motor fuel collection and distribution.

TABLE 7*
West Virginia
Disposition of Motor Fuel Tax Receipts

Tax	Amount	Exemptions
All Motor Fuel	10.5 cents/gal.	None
Receiving Agency	Proportion	Purpose
State Tax Department	Amount Required	Refund of Tax and Cost of Collection
State Road Fund	9/14 of Total Motor Fuels Tax	Payment of Bonds, Construction, Maintenance, Administration
State Road Fund	5/14 of Total Motor Fuels Tax	Feeder Roads and State Local Service Roads

*Highway Taxes and Fees.

Louisiana typifies the non-dedicated state because it mixes its motor fuel receipts with the general state taxes. The state Department of Transportation then receives its budget through a legislative appropriation. Since this procedure does not guarantee the application of those receipts to highways, it is vulnerable to the charge that the state roads will not receive the total revenue levied upon the users of those roads.

The next table illustrates Louisiana's disposition as a non-dedicated highway funding state:

TABLE 8*
Louisiana
Disposition of State Motor Fuel Tax

Tax	Amount	Exemptions
Motor Fuel	8 cents/gal.	None
Receiver	Proportion	Purpose
State Treasurer	Amount Required	Refund of Tax
State General Fund	Remainder	Subject to Appropriations for Highways and Other Purposes

*Highway Taxes and Fees.

Louisiana motor fuel receipts also provide for funding highway enforcement and public transportation programs. Those programs are examples of non-highway uses; again they violate the user principle of tax collection.

State Aid to Local Governments

State financial support for local road programs varies. Most states containing counties with established road programs earmark funds for use on the local system. However, the method of distribution varies considerably. For example, Alabama, Arkansas, Florida and Kentucky send a portion or all of state monies dedicated to local rural roads directly to counties. Georgia and Mississippi hold local rural road funds in their state highway department and individual counties draw against the allocation as work is completed.

The allotments to the counties are also determined in a variety of ways. Statutory formulas provide for local rural road appropriations in Alabama, Arkansas, Florida, Kentucky, Maryland and Mississippi, for example, while Georgia and Louisiana rely on the budget process after determining road program priorities.

Transactions which involve the flow of funds from states to local governments include: (1) amounts paid to local governments under contractual agreements whereby counties or municipalities perform construction or maintenance work for the state highway department; (2) federal-aid funds received in reimbursement for the federal share of the cost of federal-local projects; (3) payments on county or other local obligations assumed by the states as reimbursement for the cost of local roads added to the state highway systems.¹⁹

Numerous state transactions or activities that benefit local government do not involve the flow of funds. Among these transactions are: (1) advisory, consulting and supervisory services or aid in kind (for example, free provision of road materials or loans of equipment); (2) assumption by a state of responsibility for construction and maintenance of county roads or municipal streets; (3) payments on county or other local obligations assumed by the states as reimbursement for the cost of joint state-local projects of local road systems.²⁰

Local Aid for Highways

Local governments in twelve of the southern states bear some responsibility for performing road work. Of the remaining three southern states, North Carolina and West Virginia have total state responsibility, while Virginia has responsibility in all but two of its counties.

Local support for road programs varies. Counties perform work using state allocated funds, their own general funds, or levy taxes on their residents specifically for road purposes.

As state road fund receipts have been unable to keep pace with costs of maintenance and construction, local government allocations from the state have suffered the same experience. This situation has forced many local governments to appropriate local funds for road programs.

County governments have developed two methods of providing funds for local road programs: (1) A general appropriation from total revenue receipts; or (2) The levying of specific taxes and the dedication of these taxes for road use.

If the general appropriation method is used, the local governing body mingles some form of property, occupational or sales tax with federal revenue sharing funds in the formulation of its annual budget. Should the local governing body decide local roads need funding, a general appropriation is made from the available revenues.

Some local governing bodies, such as those in Alabama, Mississippi and Texas, also levy taxes for the specific purpose of funding a local road program. Residents in Texas counties, for example, are subject to a \$.30 per hundred general property tax rate.²¹ However, the Texas legislature and voters have approved two specific property tax levies which could conceivably dedicate an additional \$.45 per hundred assessment against real property specifically for road purposes.²²

Counties which levy specific taxes for road purposes will usually combine the taxes with some type of general appropriation from the local governing body. In general, local governments which use this type of financing arrangement are extensively involved in highway programs.

In a later discussion, the Texas method of administering a rural road program, which provides for extensive local responsibility, will be examined in more detail. Information will also be developed on Virginia, which has a state-oriented program, and Maryland, where state and county governments share highway responsibility.

Administration of Rural Road Systems in the South

Rationale for State Responsibility

State control of rural roads in the South began in the 1930s at a time when the member states were building and maintaining roads with federal public works project funds. During this period, local governments lacked both a tax base upon which to establish a rural highway network and the appropriations from state and federal user tax receipts to support local road programs.

As the states increased their road mileage, it became necessary to expend more user tax receipts on maintenance, thus furthering state control. Tax dollars were also used by the states to employ engineers and planners in the establishment of continuous highway networks with uniform standards in the individual states.

In the post-World War II era, as better roads were constructed, the attitude of many southern legislatures was that the maintenance of the existing rural road system would be in jeopardy if the responsibility for rural roads were shifted from the state to local jurisdictions. Although the older roads were no longer carrying their former traffic volumes, they were an integral

part of the "farm to market" network. To ensure that these roads would remain state responsibility, state assemblies began to earmark portions of the user fees for their upkeep, using state maintenance crews to perform the work.

Essentially roads became a state responsibility because of three factors: (1) The broader tax base of state governments allows for greater flexibility in programs; (2) The technical expertise necessary to engage in construction and maintenance could be better maintained by state governments; and (3) State legislatures desired to ensure the integrity of the older "farm to market system" by earmarking funds and maintenance crews for those roads.

The Commonwealth of Virginia is an example of a state which bears maintenance responsibility for the major part of its road system. Virginia has 54,232 miles of rural roads; only 948 miles are maintained by a county government.²³

In 1932, Virginia passed legislation which provided that the state be responsible for all roads. The primary reason was that counties did not have a sufficient tax base to effectively construct and maintain roads; as the state role in highway programs developed, county involvement was viewed as a duplication of service.

The initial act provided that counties that wished to retain road maintenance functions could do so. The 948 miles of local roads are accounted for by the fact that Arlington and Henrico Counties opted for local involvement. The balance of what would otherwise be classified as county roads is part of the state system of secondary roads.²⁴

Virginia currently has an 11¢ motor fuel tax, with an exemption for aviation fuel. The motor fuel revenues are used primarily to fund programs related to state highway construction and maintenance. Expenditure categories include:

- (a) Maintenance and construction for counties not included (Arlington and Henrico) in the state secondary system;
- (b) Aid to regional transportation commissions or local governments;
- (c) Aid to interstate highway system;
- (d) Aid to state primary highway system;
- (e) Aid to state secondary highway system;
- (f) Aid to urban streets; and
- (g) Aid to cities and towns.²⁵

Arlington County and Henrico County are the only counties in Virginia with a local road program. These counties receive financial aid from the state, but designate their own maintenance projects and perform their own work.

The remainder of the counties have placed their local roads into the state secondary system. This system was initiated in 1932, but changes have been made periodically to assure continued funding of the

state secondary system. Two sources of funds are available for secondary roads. General construction and maintenance funds may be applied to the secondary system, as may special funds for secondary roads.

The general highway fund is used to complete construction and maintenance on the total highway system in Virginia. The secondary road system essentially competes with the other systems for work to be completed. Projects are decided on by resident state engineers and approved by the head of the state highway department, based on determined needs within a geographic area.

The state secondary highway program is designed for the improvement of the state secondary system. Local officials assist in the selection of projects in their areas, but the program uses state funds and work crews.

The Board of Supervisors in each county is required to meet with the state resident highway engineer for development of needed improvements on the secondary roads. Initially, a six-year plan is devised; every two years the plan is amended. Before the expenditure of funds, an annual priority hearing is held to determine projects and allocate funds.

Funds provided to each county are based on a formula which compares each county's square mileage, population, secondary road mileage, motor vehicle registrations and traffic volume to those of the whole state. Once the county shares have been determined, the allocations are made and projects can begin.

Counties do not receive money directly from the state treasury, however. After the allocations are made and projects selected, contracts are let by the state. Any work done on a state secondary road is debited against that county's allocation and paid by the state to the contractor. Under the Virginia program, the rural roads (except for those of Arlington and Henrico Counties) are totally state controlled, with the only local function being input in the priority planning phase.²⁶

Rationale for Local Responsibility

The growth of the rural highway system has stimulated a gradual shift of maintenance responsibility to local government. This change came about because in most southern states, the maintenance of lightly travelled rural roads was the state's lowest work priority. As a result, necessary maintenance would be delayed until higher priority work on federal and state system roads was completed.

Local government responded by developing local road programs, in which a system of local roads was established. Additionally, as a new state road was constructed, the old road it was meant to replace would often be dropped from the state highway system. State governments eventually made provisions for counties to assume responsibility for these roads. Thus many were added to local road systems.

State legislatures provided funds for maintenance of these local roads, but as county mileage grew, revenues became deficient. Many counties responded by contributing portions of locally generated revenues to their maintenance programs.

The local road program allows for road work to be completed which the state may otherwise neglect. Other inducements for the development of a local road program include the assessment of local needs at the local level and the removal of cumbersome bidding guidelines required by the individual states. With local responsibility, local governments still let bids, but the procedures for awarding contracts are not as rigid as the state process.

Texas County Road Administration

Texas provides the best example of a locally oriented road program. The state has almost 200,000 miles of rural roads; approximately 133,000 are locally maintained. Counties in Texas have an option between a centralized and decentralized form of road administration. However, as a recently completed Texas study indicates, no accurate count exists regarding which type of administration these counties use.²⁷ A county which has opted for a centralized program is said to have a "unit road system." Centralized road administration requires the county to hire a registered engineer to administer and to operate its road department. The local commissions perform the policymaking function.

Variations exist within the centralized administration system. For example, the local governing body may retain a precinct operation, but hire a road engineer to coordinate the total effort. Road districts may also be created within counties or between counties, with the road engineer being responsible to the district membership.

Under a decentralized administration, each local government member retains responsibility for roads within his precinct. Even with decentralized administration, the collective local body may be required to approve large purchases, and each commissioner could retain the services of a contractor to undertake specific jobs.

Advocates of the centralized form of road administration cite greater professionalism, less politicizing of highway issues, and economy of scale as benefits for the counties. The critics of the centralized system believe that the commissioner may lose control over precinct road activity and that the engineer is often subject to uneven or excessive political influence, creating problems in proper program administration.²⁸

Financing County Roads. Counties in Texas have several sources of revenue. The local property tax appears to be the most significant contributor to local road programs. Other revenue includes traffic fines, interest, right-of-way reimbursement, motor vehicle license fees, federal aid, lateral road aid and general fund appropriations.

Table 9 depicts the amount and percentage of revenues produced for road purposes.

TABLE 9*
Total Current Revenues for Road Purposes
All Texas Counties, 1974 and 1978

Source	Amount (In Millions)		Percent of Total Revenue	
	1974	1978	1974	1978
Ad Valorem Taxes	105.5	166.2	51.7	60.5
Traffic Fines	6.6	11.2	3.2	4.0
Interests on Investments	9.3	12.5	4.6	4.6
Right-of-Way Reimbursement	12.4	7.2	6.1	2.6
Motor Vehicle License Fees	34.0	37.0	16.7	13.5
Federal Aid	22.8	23.1	11.2	8.4
General Fund Appropriations	5.1	8.5	2.5	3.1
Other	.9	1.4	.4	.5
TOTAL	<u>203.9</u>	<u>274.7</u>	<u>100.0%</u>	<u>100.0%</u>

***Current County Road Problems in Texas.**

Of the three largest revenues sources, the local property tax increased its contribution the most during the 1974-1978 period. Motor vehicle license fees and federal aid grew only slightly.

Since the county governments place so much emphasis on locally generated revenues, their methods for raising revenue warrant examination. In Texas, a county may devote property tax monies for roads under four separate authorizations:

- 1) general fund tax (\$.80 limit), all or part;
- 2) farm-to-market and lateral road or flood control tax (\$.30 limit);
- 3) special road and bridge tax (\$.15 limit); or
- 4) unlimited tax.²⁹

Counties may levy \$.45 additional property tax and earmark the revenue specifically for road projects. They may also budget any portion of the revenue receipts for roads.

Texas counties also deal with problems of acquiring right-of-way for road projects. Counties must acquire right-of-way to initiate a project, and the state reimburses 90% of the right-of-way cost. Compared to total available revenue, the amount of right-of-way reimbursement has declined approximately 4% from 1974 to 1978.

Texas county governments contribute 60.5% of local revenue towards roads;³⁰ the local average nationwide is 20.5%.³¹ State funds in Texas account for 18.0% of the total funds available to counties for roads.³² Nationwide, the state allocation to counties for roads is approximately 42%.³³

Local Road Costs. While Texas differs significantly from other states in its sources of funding for local roads, it shares their problems: road conditions are not at optimum levels, and costs for construction and maintenance are continuing to escalate. The following tables illustrate the cost problems faced by Texas in its construction and maintenance programs.

Table 10*

Average Cost for New Construction
of Texas Farm-to-Market Road System

Year	Number of New FM Miles	Total Cost (in millions)	Average Cost Per Mile
1948	1302	\$13.6	\$10,431
1960	1013	28.9	28,573
1970	514	30.1	58,441

*Current County Road Problems in Texas

Table 11*

Average Cost for Maintenance
of Texas Farm-to-Market System

Year	Number of Miles Maintained	Total Cost (in millions)	Average Cost Per Mile
1952	16,441	\$ 6.3	\$ 383
1960	31,204	17.6	564
1970	38,386	32.8	854
1980	40,600	NA	2369**

*Current County Road Problems in Texas

**Estimated

Specific information regarding bridge conditions is available through an inventory required by the United States Department of Transportation under the Highway Bridge Replacement and Rehabilitation Program. Bridges are inspected according to a federal formula and given a sufficiency rating. The following table notes the results of a recent survey of bridges in Texas.

Table 12*

Conditions of Texas County
Bridges: September, 1980

Conditions of Bridge	Number	Percent of Total
Obsolete	3,619	31.5%
Deficient	5,948	51.7%
Not Deficient or Obsolete	1,932	16.8%
TOTAL	11,499	

*Current County Road Problems in Texas

The survey shows 51.7% of the county bridges to be structurally deficient. Nationally, by contrast, 38% of local bridges are standard.³⁴

Rationale for Shared Responsibility

Several southern states have had to rely on cooperative efforts with their individual counties to maintain local road systems. For example, a number of counties in Alabama and Kentucky, as recently as 1979, had state forces performing work on local rural roads, although the majority of counties in these states were performing their own work. At present, several counties in Kentucky and Tennessee rely totally on the state allocation to fund their local road program, while the remaining counties supplement local road programs with local financial support.

The concept of shared or cooperative responsibility is both a function of economic circumstances and a product of the recent trend toward more local control of road mileage in the South. As the rural road mileage has had to increase, those sparsely populated counties with narrow tax bases have found that they could afford neither the capital investments nor the on-going operating expenses associated with a local road program. Local jurisdictions in this situation have therefore been forced to rely on state government to perform necessary road work or provide funding.

Legislative bodies in several southern states, however, have tried to shift local rural road responsibility to the counties in the recent past. Alabama, Kentucky, and Maryland are examples. But, in each state, a minority of counties were either satisfied with the level of maintenance performed by the state and did not wish to assume expanded road responsibilities, or they could not afford to do so.

Because Maryland best typifies a member state with joint responsibility for local road maintenance, a brief review of how rural road maintenance is accomplished in that state follows.

Maryland levies a 9¢ per gallon fuel tax. Revenues from this tax comprise approximately 45 percent of the DOT budget. Additional revenues are generated from registration fees, license fees, titling fees and taxes, fines and penalties, and out-of-state carrier taxes.

Of the total revenues collected, 65 percent accrue to the Transportation Trust Fund for use on state highways, ports, airports and transit facilities. Seventeen and one-half percent is allocated to the City of Baltimore for debt service requirements on city highway construction bonds and for the construction and maintenance of city roads and transportation facilities. The remaining 17 1/2 percent is allocated to counties and municipalities (other than Baltimore) for debt service on county highway construction bonds and for the construction and maintenance of local highways.

Each county's allocation for local roads is determined by the following formula: 1/2 is based on the county's total mileage and 1/2 is based on the county's total motor vehicle registration. Each county must in turn share its portion with municipalities in the county as follows: 1/2 is based on county mileage within the municipalities and 1/2 is based on the county's total motor vehicles registered in municipalities. Seventeen of Maryland's twenty-three counties receive funds in this manner. In Calvert, Cecil, Charles, Kent, St. Mary's and Talbot Counties, the State Highway Administration retains the funds and performs the work on roads classified as part of the local or county road system.³⁵

All twenty-three counties use general fund monies to supplement the state appropriation. Many levy a "piggy back" income tax to generate local revenues for this purpose. Counties which have their own road crews receive allocations monthly and have the option of letting bids themselves or through the state. Counties cannot ask the state to bid on county road projects, however.

In the six counties which do not perform their own road work, the resident state engineer, with the approval of the county commissioners, selects local roads on which state crews will perform work. The state then contracts to do the work or secures private contractors to perform the work for these individual counties, and either credits the work against the county's rural road appropriation or is reimbursed with locally raised funds. In the remaining seventeen counties, the local road board decides which county roads the state allocation will be spent on.

In Allegany, Caroline, Dorchester, Carrett, Queen Anne's, Somerset, and Worcester Counties, the Board of County Commissioners constitutes the Road Board. In Wicomico County, the County Council constitutes the Road Board. In Frederick County it consists of five members appointed by the Commissioners for 5-year staggered terms. In Carroll, Harford, and Washington Counties, the County Commissioners are responsible for county roads, but no specific legislation makes them a Road Board. In Ann Arundel, Howard, Prince George's, Montgomery and Wicomico Counties, the Department of Public Works has charge of roads and is responsible to the County Council. In Baltimore County, the line of authority runs to the county administrative officer and thence to the County Executive.³⁶

Joint responsibility for local road maintenance came about for reasons mentioned earlier. Each of the six counties not performing road work is predominantly rural and sparsely populated. None of the six has ever developed a local road program. The state, therefore, is obliged to perform the work or hire private contractors to do it.

In addition to the state allocation to the counties that is applied to local roads, each county has state and federal monies applied to those roads classified as part of the federal or state road systems. To determine which rural roads within the state system will be eligible for inclusion in the state road program, State Highway Administration officials meet annually with the county commissioners or councilors of each county. Thereafter, construction and maintenance is performed by state crews on the agreed upon roads. If county and state officials do not concur on the selection of roads, the state has final program determination powers, since no provision is made for amendments to the state program and the State Highway Administration administers program funds.

FOOTNOTES

1. The Book of the States, 1980-81 (The Council of State Governments, Lexington, Kentucky), p. 391.
2. Ibid.
3. Ibid.
4. Highway Statistics, 1979 (Washington, D.C., United States Department of Transportation, Federal Highway Administration, 1979), p. 17.
5. Paul Matthews, Potholes, Pennies and Politics (Highway Users Federation, St. Louis, Missouri, 1980), p. 1.
6. Highway Functional Classifications: Concepts, Criteria and Procedures (U.S. Department of Transportation, Federal Highway Administration, Transmittal 155, Vol. 20, Appendix 12, July, 1974), pp. I-3.
7. Ibid, pp. II-8, II-9.
8. Ibid, pp. II-9, II-10.
9. Ibid, p. II-10.
10. Report of the Florida Transportation Policy Study Commission (State of Florida, Governor Bob Graham, March, 1980), p. 9.
11. Ibid, p. 10.
12. Ibid, p. 11.
13. Report of the Governor's Task Force on Transportation (Commonwealth of Kentucky, Governor Julian M. Carroll, November, 1979), p. 82.
14. Current County Road Problems in Texas (Texas Advisory Commission on Intergovernmental Relations, Austin, Texas, January, 1981), p. 10.
15. Neil M. Singer, Public Microeconomics: An Introduction to Government Finance, Second Edition (Little, Brown and Company, Boston, Massachusetts, 1976), p. 249.
16. Book of the States, p. 391.
17. Highway Statistics, 1979, p. 34.
18. Ibid.
19. Ibid.
20. Ibid.
21. Current County Road Problems in Texas, p. 6.

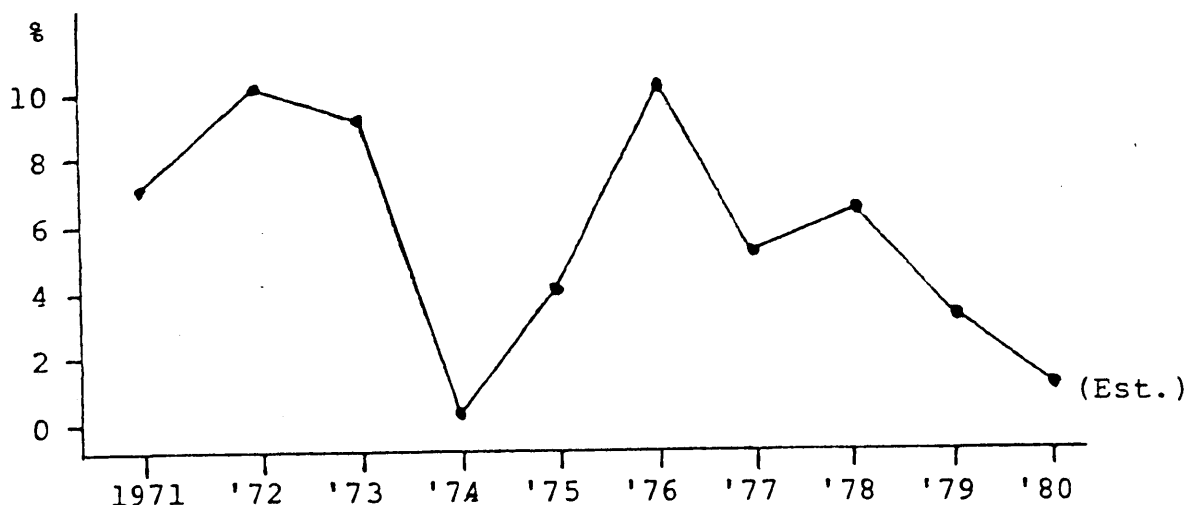
22. Book of the States, p. 391.
23. Highway Taxes and Fees, How They Are Collected and Distributed (U. S. Department of Transportation, Federal Highway Administration, Washington, D.C., 1981), p. 39.
24. Ibid.
25. Ibid.
26. Interview with Sandy Brown, Secondary Road Engineer, Virginia Department of Highways and Transportation, Richmond, Virginia, May 14, 1981.
27. Current County Road Problems in Texas, p. 16.
28. Ibid., p. 15.
29. Ibid., p. 6.
30. Ibid.
31. Ibid., p. 21.
32. Ibid., p. 6.
33. Ibid., p. 21.
34. "Exclusive National Bridge Inventory," Better Roads, Vol. 51, No. 4 (April, 1981), p. 11.
35. Maryland Manual, 1981-82 (Hall of Records Commission, Annapolis, Md., 1981), p. 280.
36. Ibid., p. 449.

STATE HIGHWAY TAX REVENUES

by C. Gilmore Dutton

The highway cost/funding dilemma in which most states find themselves today is illustrated in the Figure in the Introduction, above, and in Figure 1, below. Nationally, while highway construction and maintenance costs have increased at an annual average rate during the last five years of 10.5 percent and 10.2 percent, respectively, state highway tax revenues have averaged an annual growth of only 5 percent for the same period. (See Table 1, this Section, for dollar amounts of state highway tax revenues.)

FIGURE 1
ANNUAL PERCENTAGE INCREASE, STATE HIGHWAY TAX REVENUES,
1971-1980



The decade of the '70's began on an optimistic note for state highway tax revenues. Receipts averaged an annual growth of nearly 9 percent during the first three years of the period, before the disastrous oil embargo of 1974. Even then there were portents of a return to a level of relative prosperity, with increases climbing to 4 percent in 1975 and 10 percent in 1976. Unfortunately, the recovery was short-lived and a definite downward trend was established in the latter part of the decade.

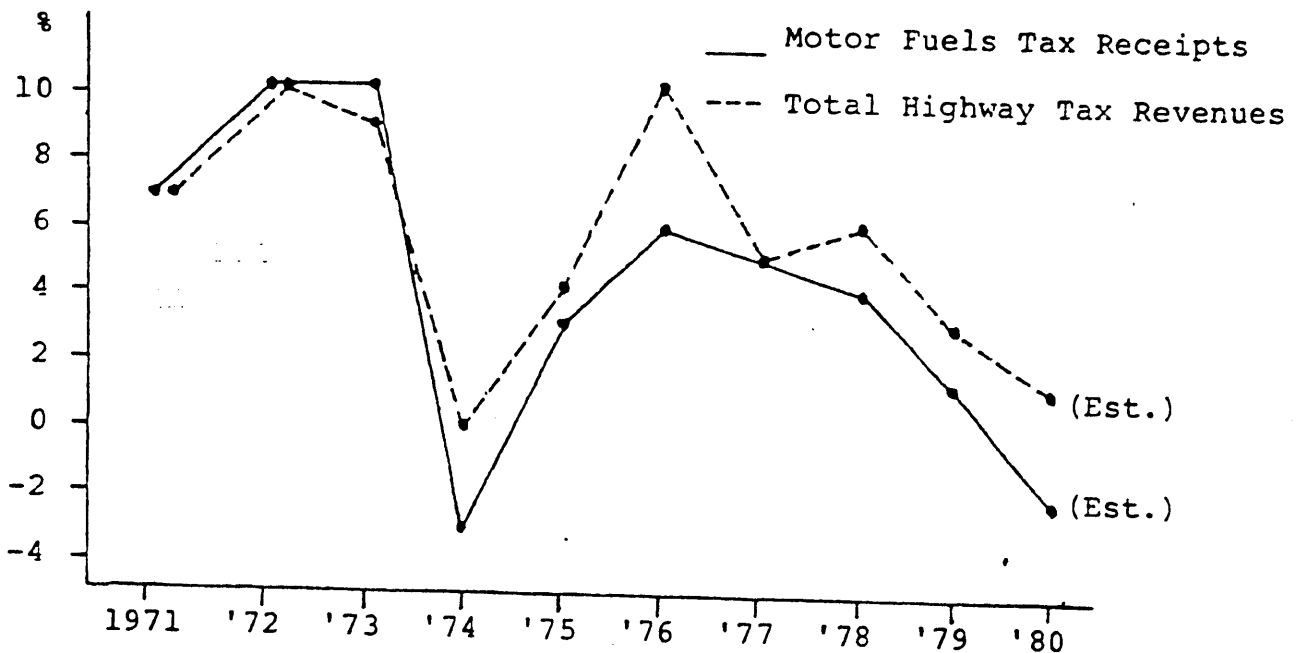
Motor Fuels Tax Receipts

The story of state highway tax revenues is the story of state motor fuels tax receipts. Historically, motor fuels - gasoline, diesel fuels, butane,

etc. - have contributed the lion's share of highway tax revenues, with vehicle registration fees and other fees running a poor second and third. (See Table 2, this Section, for dollar amounts of motor fuels tax, vehicle registration fee, and miscellaneous fee receipts, with percent of total for each.)

Although the contribution of motor fuels tax receipts to the total of highway tax revenues declined somewhat during the '70's, its influence on the total fund was probably more evident during this period than in any other recent decade. The extreme, near parallel fluctuations in both statistics bore out the reliance of highway revenues on motor fuels tax receipts. As can be observed in Figure 2, below, when times were good for motor fuels, the total fund prospered, but when times were bad, it suffered.

FIGURE 2
ANNUAL PERCENTAGE CHANGE, STATE MOTOR FUELS
TAX RECEIPTS AND TOTAL HIGHWAY TAX REVENUES,
1971-1980



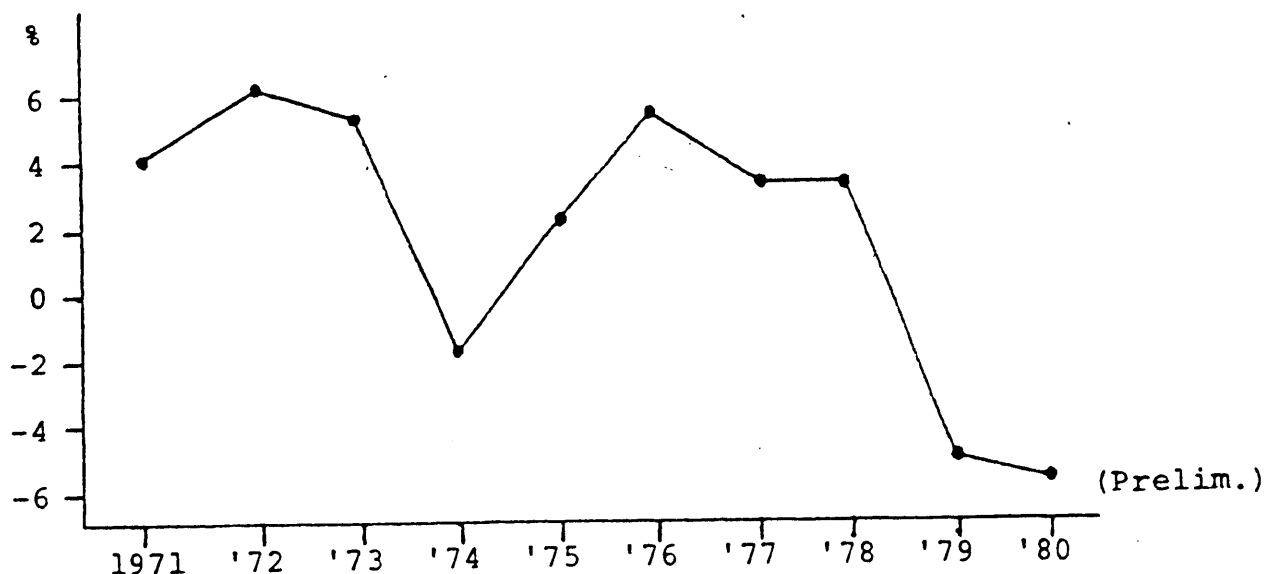
If motor fuels tax receipts is the culprit in the mystery, "Whatever happened to state highway tax revenues?" - it is also a victim. Declining gasoline consumption and unit rate taxing systems combined to wound, severely, if not mortally, the corpus of motor fuels tax receipts.

Gasoline, which accounts for approximately 90% of all fuels used to propel motor vehicles, was consumed in traditional fashion during the early years of the '70's. As Figure 3 shows, gasoline consumption increased in 1971, 1972, and 1973 by 4, 6, and 5 percent, respectively. (See Table 3, this Section for amount of consumption and average price of gasoline.)

FIGURE 3

ANNUAL PERCENTAGE INCREASE, CONSUMPTION OF
GASOLINE IN THE UNITED STATES,

1970-1980



The beginning of the end for annual increases in gasoline consumption began with the 1974 oil embargo, although at the time that development would have been difficult to foresee. Having successfully survived its experiment in international restraint of trade, OPEC began a rapid escalation of the price of oil. The result was an increase in the average retail price of gasoline from 36 cents per gallon in 1972, to 59 cents per gallon in 1976, to \$1.22 per gallon in 1980, a 239 percent increase in eight years.

With the restoration of near normal supplies of gasoline in 1975, consumption increased 2 percent over the low of 1974. And with prices increasing a moderate 4 percent in 1976, consumption increased by 5 percent, an annual level of increase enjoyed during the pre-1974 years.

The 7 percent and 5 percent gasoline price increases in 1977 and 1978 stabilized consumption increases at 3 percent for each year, but the 33 percent and 39 percent price increases experienced in 1979 and 1980 reduced consumption by 5 percent and 6 percent, respectively, below the preceding year. The tabulation of gasoline consumption from 1970 to 1980 reveals an overall increase of 14 percent for the period.

In 1970 every state levied a flat rate, cents-per-gallon tax on motor fuels. At the close of 1980, forty-three states and the District of Columbia were still levying a flat rate tax. During the same period thirty-seven states and the District increased their unit rates, the average levy rising from 7.5 cents in 1973 to 9 cents in 1980, a modest 20 percent increase.

Had each state during the early '70's imposed a variable rate tax based upon price, the resultant 200-plus percent increase in receipts would have been more than sufficient to meet the 166 percent increase in highway construction costs that occurred between 1970 and 1980. Or an increase in flat rates from 7.5 cents to an average of 20 cents by the close of the period

would have raised sufficient revenues to meet construction costs. To date, it has been a case of too little and too late.

Vehicle Registration and Other Fees

Collectively, vehicle registration and other fees make up a significant percentage of the total of state highway tax revenues. The importance of the group, however, is diminished by the number of taxes which comprise the group.

Vehicle registration fees are made up of charges for the privilege of operating on public thoroughfares levied against automobiles, buses, trucks and tractor trucks, trailers, and motorcycles. Miscellaneous fees include driver's licenses, certificate of title fees, special titling taxes, public carrier taxes, and a variety of other taxes imposed by individual states.

Automobile registrations are the most important factor among the vehicle privilege taxes, accounting for approximately 55 percent of that group's total tax dollars. Trucks and tractor truck registrations are second in importance, contributing approximately 38 percent to the total. Special titling fees and driver's licenses are the most significant levies among the many charges comprising the miscellaneous group, together making up approximately 45 percent of the total.

The value of vehicle registration and miscellaneous fees relative to the total of state highway tax revenues increased markedly during the latter half of the '70's. At the beginning of the decade, vehicle registration and miscellaneous fees made up roughly 37 percent of the total fund; by the end of the period, they were contributing nearly 45 percent. It must be noted, however, that the rise in value of fees among total revenues was due more to the decline of motor fuel receipts than to an increase in vehicle registration fee or miscellaneous fee receipts.

Southern Legislative Conference States

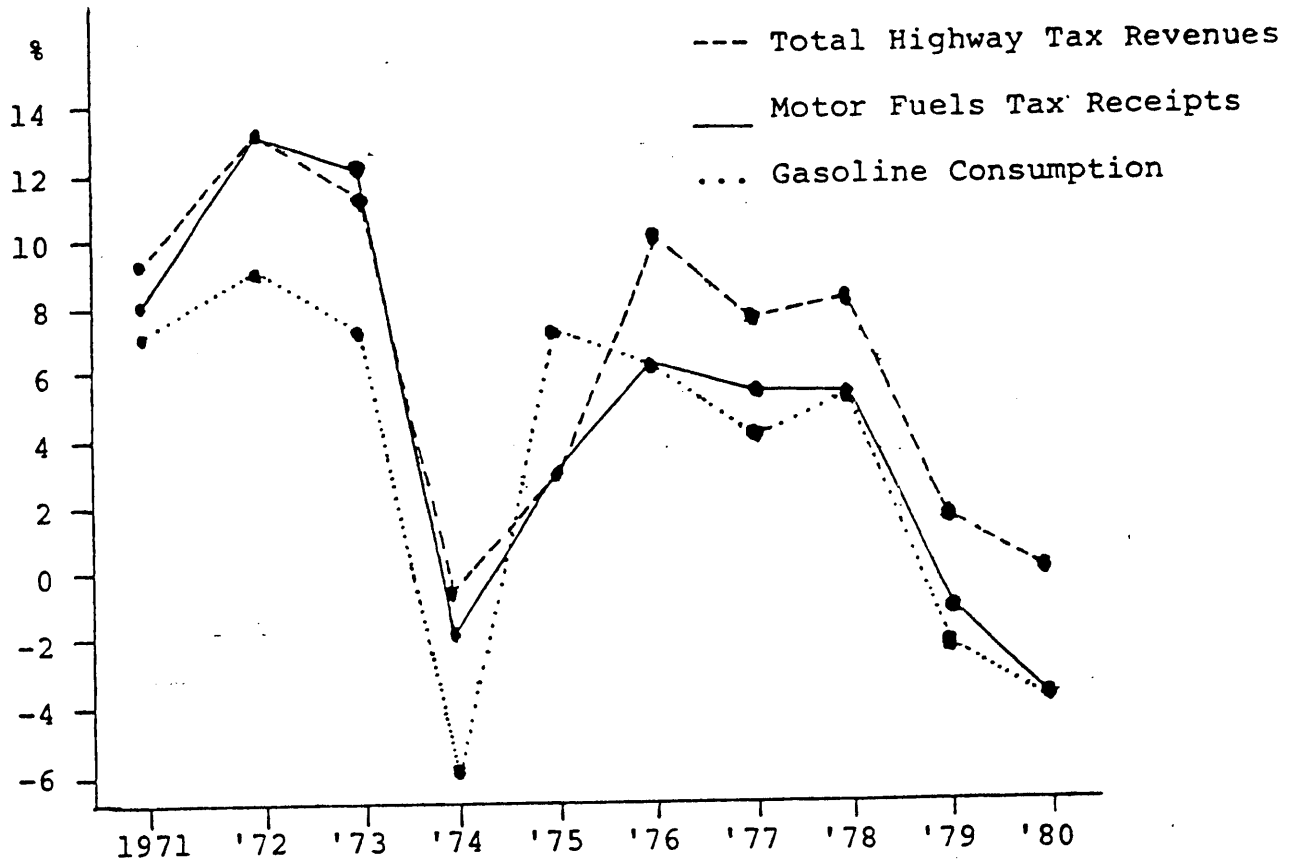
Statistics for the fifteen Southern Legislative Conference (SLC) states and the District of Columbia (D. C.) generally resemble those for the nation as a whole. As can be seen by comparing Figure 4, below, with the figures presented earlier, the relationship which exists in the SLC states and D. C. between motor fuels tax receipts and total state highway tax revenues, and between motor fuels tax receipts and gasoline consumption, parallels the total United States experience. (See Tables 4, 5, and 6, this Section, for Total Highway Revenues; Motor Fuels Tax, Vehicle Registration Fee, and Miscellaneous Fee Receipts; and Gasoline Consumption in the Southern Legislative States and District of Columbia.)

As in the nation, percentage increases in motor fuels receipts, highway revenues, and gasoline consumption, peaked in 1972 for the SLC states and D. C., and hit the low for the decade in 1974, only to recover temporarily in 1976. While no regional or individual state price data was available to this writer, it is probably safe to assume that an increase in gasoline prices resulted in 1979 and 1980 in decline in gasoline consumption in the SLC states and D. C.

FIGURE 4

ANNUAL PERCENTAGE INCREASE, TOTAL HIGHWAY TAX REVENUES,
MOTOR FUELS TAX RECEIPTS, AND CONSUMPTION OF GASOLINE
SOUTHERN LEGISLATIVE CONFERENCE STATES AND
DISTRICT OF COLUMBIA,

1970-1980



Even the change in the value of vehicle registration and miscellaneous fees relative to the total of highway tax revenues in the SLC states and D. C. followed the U. S. pattern. Regionally, fees accounted for approximately 35 percent of the total in 1970, compared to a 37 percent relative value nationally. By 1980, fees represented 45 percent of the total, both in the SLC states and D. C., and the nation.

There is, however, one notable difference in the national and regional data that should have a bearing on the development of future, regional gasoline tax strategies. In recent years the annual percentage changes in gasoline consumption and motor fuels tax receipts have been nearly identical in the SLC states and D. C., while nationally, motor fuel tax receipts have done better than gasoline consumption (i. e., the receipts have recorded higher gains and lower losses than has consumption). And a review of the states that have enacted increases in gasoline tax rates, or switched from a flat rate to a variable rate during the last five years, discloses that a greater percentage of non-SLC states have updated their laws than have SLC member states.

The data, then, confirm the obvious; i. e., that tax receipts can be maintained in the face of a declining tax base by increasing the tax rate, or, where available, by adopting a different base. The alternative is to allow

receipts to follow the path of the tax base.

Recent Developments in State Highway Taxes

During the past five years, 1976 through 1980, eighteen states increased their flat rate taxes on motor fuels, several doing so twice, some as many as three times. Seven other states converted their flat rates to variable rates.

The most popular rate increase during this period was 1 cent (sixteen times), although during 1980, all but one of the six states enacting increases did so in excess of 1 cent. The largest rate increase was 4 cents (Alabama, 1980); the smallest increase was 1/4 cent (Montana, 1977).

As preparation for the writing of this paper, interviews were conducted with legislative officials of the sixteen states which had either increased their motor fuel flat rate taxes or changed to a variable rate tax during 1979 and 1980. The representatives of the flat rate increase states were asked if converting to a variable rate tax had been considered, and, if so, why that alternative had not been adopted.

Three states responded that a variable rate tax had not been a legislative consideration; the legislature had simply adopted the governor's recommendation for a flat rate tax increase. The remaining state legislatures had all considered a variable rate tax, with two even rejecting the governor's proposal for such a tax.

The most frequent reason given for staying with a flat rate tax was to retain legislative control over the rate of tax and the amount of money raised for highway purposes. Several legislatures had expressed concern that the adoption of a variable rate tax would allow events in foreign countries to dictate the tax rate in their state. The two state legislatures which rejected their Governor's proposal for a variable rate tax did so, in the opinion of our correspondents, because of their unfamiliarity with the concept and the complexity of the legislation.

The legislative spokesmen for all sixteen states were asked about increases in registration fees. Six states had enacted increases; the remaining ten had considered but rejected such an increase. More often than not the rejection was the result of opting for an increase in motor fuel taxes, the major source of revenue, and not wanting to be responsible for two tax increases. One state legislature (Minnesota) experienced a storm of protest when it considered increasing registration fees.

Seven states have adopted a variable rate tax on motor fuels; the first was Washington, in 1977. The tax base varies, from (a) the average statewide wholesale price of fuel (New Mexico, Kentucky, and Massachusetts), to (b) the average statewide retail price of fuel (Indiana and Washington), to (c) the retail price at the time of sale (Georgia), to (d) the per-gallon purchase price of fuel for the state motor vehicle fleet (Nebraska). In every case but one (Georgia), the tax rate is expressed in cents-per-gallon before it is actually levied.

The tax rates of the variable rate states range widely: Nebraska - 2%, Georgia - 3%, Indiana - 8%, Kentucky - 9%, Washington - 10%, Massachusetts - 12%.¹ New Mexico's tax rate, currently 8 cents, will be increased in 1 cent

increments, up to a maximum of 11 cents, with each 10 cents increase in the wholesale price of gasoline.

Generally, administrative convenience and convenience to the taxpayer are sufficient argument to levy the variable rate tax in unit tax fashion, rather than in ad valorem, percent of transaction, fashion. But in Kentucky there was an added incentive.

When Kentucky's Governor first proposed variable rate tax legislation, the bill, drawn by the Department of Revenue, would have taxed each wholesale transaction at 9 percent of the wholesale price. The Ashland Oil Company, Kentucky's largest home-based corporation, quickly pointed out that the then current differential between its wholesale price of gasoline, and Chevron's wholesale price, was 10 cents per gallon, with Ashland Oil's price being the higher price. A 9 percent tax would have added nearly another penny to the per gallon difference, putting Ashland Oil at a further competitive disadvantage. The state legislature quickly amended the bill to base the tax on an average statewide wholesale price.

The variable rate tax states that are on a cyclic rate adjustment schedule are divided among monthly, quarterly, semi-annual, and annual adjustments. Nebraska adjusts monthly, Kentucky and Massachusetts, quarterly, Indiana and Washington, semi-annually, and New Mexico, annually. Responses of the four variable rate states interviewed indicate that a quarterly adjustment cycle offers the maximum revenue raising potential, without creating an undue administrative burden.

Except for Georgia, the states levying a variable rate tax are all continuing to impose the tax on the wholesaler/importer/distributor, as they did under their flat rate tax systems.

Future Prospects

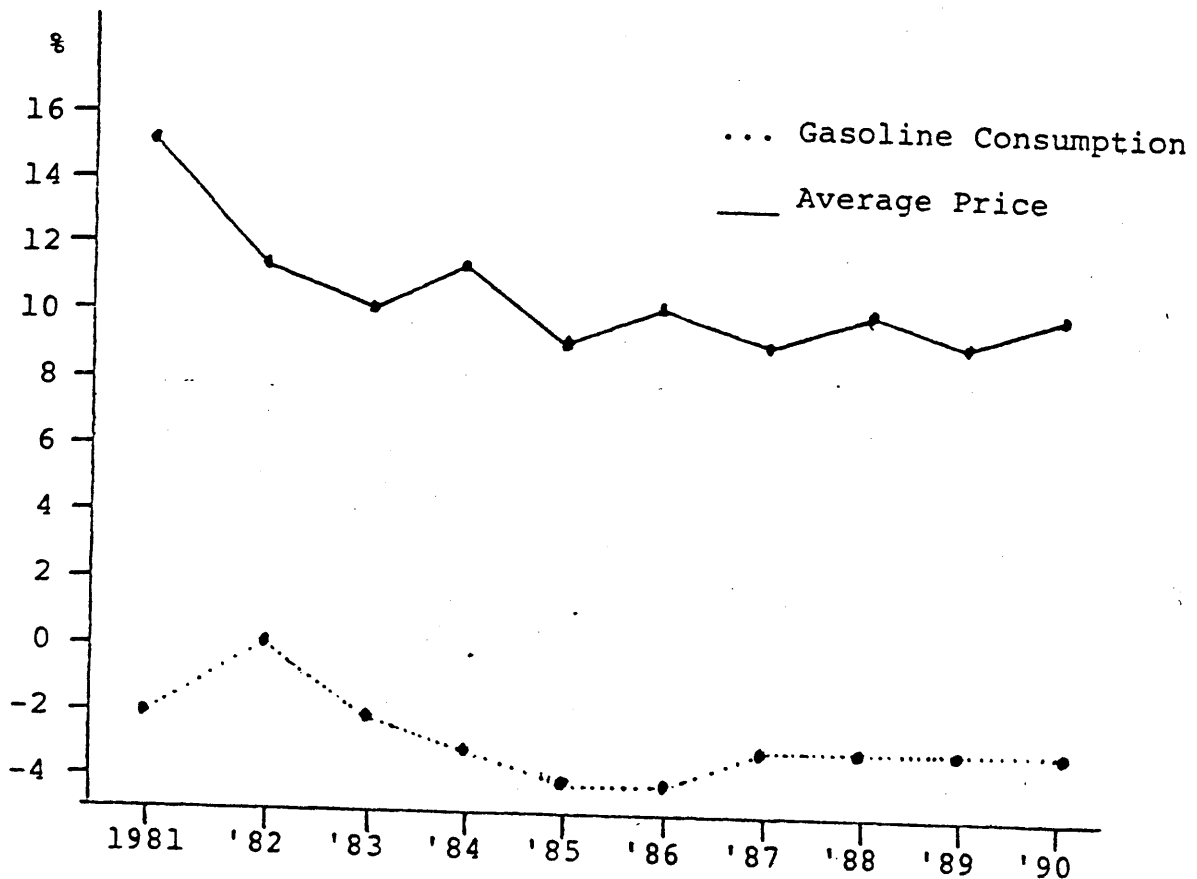
State highway tax revenues will continue to rise and fall on the vagaries of motor fuels tax receipts. Registration fees and other fees will continue to be significant contributors to the highway fund, but the prospects of effecting substantial increases in highway revenues through fees appear dim. The multiplicity of taxes that make up the fees group, and their general visibility, add to the political problems which always accompany tax increases.

Figure 5 displays the estimated annual percentage change in gasoline consumption and the price of gasoline in the United States in the next ten years. Consumption will continue to decline, as has been the pattern for the last two years, and prices will continue to increase, as they have the last several years. (See Table 7, this Section, for amounts of estimated gasoline consumption and price.)

FIGURE 5

ANNUAL PERCENTAGE CHANGE, ESTIMATED STATE
CONSUMPTION AND AVERAGE PRICE OF "FULL SERVICE"
REGULAR LEADED GASOLINE IN THE UNITED STATES,

1981-1990



The prospects for flat rate tax system states do not look good in terms of motor fuels tax receipts. Just to maintain a constant level of receipts, state legislatures will be required to make regular, periodic adjustments in their rates. And the tendency during those adjustment sessions will be to increase rates as little as possible, which means that just keeping up with increases in construction and maintenance costs, let alone generating new money, will be a difficult proposition.

The variable tax rate states will have a much better time of it. Their main concern will be that revenues not exceed reasonable expenditure needs. Since the annual increases in gasoline prices are expected to exceed the general rate of inflation, discretionary revenues should always be available to the variable rate states.

In any case, if the annual estimates of consumption and price are accurate, the wild fluctuations of the '70's will not be repeated in the '80's. This in itself will be a major improvement, permitting states to plan ahead with reasonable expectations of success, rather than being forced to react after-the-fact.

1. Nebraska and Georgia also levy a flat tax rate of 6¢ and 7½¢ per gallon, respectively.

TABLE 1
TOTAL STATE HIGHWAY TAX REVENUES,
1970-1980*
(In Thousands of Dollars)

<u>Year</u>	<u>Amount</u>	<u>Year</u>	<u>Amount</u>
1970	10,279,275	1975	13,642,139
1971	10,964,769	1976	14,994,990
1972	12,006,474	1977	15,691,240
1973	13,141,875	1978	16,652,072
1974	13,121,049	1979	17,151,699
		1980 (Est.)**	17,275,700

*Source: Highway Statistics, U.S. Department of Transportation/
Federal Highway Administration, Years 1970 through 1979, total of
tables MF-1 and MV-2.

**Source: Highway Statistics Division, Office of Highway
Planning, Federal Highway Administration.

TABLE 2
STATE MOTOR FUELS TAX, VEHICLE REGISTRATION FEE,
AND MISCELLANEOUS FEE RECEIPTS, WITH PERCENT OF TOTAL,
1970-1980*
(In Thousands of Dollars)

<u>Year</u>	<u>Motor Fuels Tax</u>	<u>% of Total</u>	<u>Registra- tion Fees</u>	<u>% of Total</u>	<u>Miscella- neous Fees</u>	<u>% of Total</u>
1970	6,479,051	63.03	2,869,986	27.92	950,238	9.05
1971	6,901,977	62.95	3,012,693	27.48	1,050,099	9.58
1972	7,611,498	63.39	3,188,315	26.55	1,206,661	10.05
1973	8,352,458	63.56	3,451,753	26.27	1,337,664	10.18
1974	8,124,158	61.92	3,660,803	27.90	1,336,088	10.18
1975	8,353,191	61.23	3,699,329	27.12	1,407,619	10.32
1976	8,891,460	59.30	4,402,557	29.36	1,700,973	11.34
1977	9,319,297	59.39	4,426,541	28.21	1,946,002	12.40
1978	9,716,246	58.35	4,749,353	28.52	2,186,474	13.13
1979	9,784,273	57.05	5,011,881	29.22	2,355,545	13.73
1980 (Est.)**	9,572,700	55.41	5,240,350	30.33	2,462,650	14.25

*Source: Highway Statistics, U.S. Department of Transportation/
Federal Highway Administration, Years 1970 through 1979, Tables MF-1
and MV-2.

**Source: Highway Statistics Division, Office of Highway Planning,
Federal Highway Administration.

TABLE 3

STATE CONSUMPTION AND AVERAGE PRICE OF "FULL SERVICE,"
REGULAR LEADED GASOLINE IN THE UNITED STATES,

1970-1980*

<u>Year</u>	<u>Consumption</u> (Million Barrels/Day)	<u>Average Price</u>
1970	5.784	
1971	6.014	\$.36
1972	6.377	.36
1973	6.674	.36
1974	6.537	.39
1975	6.675	.52
1976	6.978	.57
1977	7.177	.59
1978	7.412	.63
1979	7.035	.66
1980 (Prelim.)	6.580	.88
		1.22

*Source: 1980 Annual Report to Congress, Energy Information Administration, Department of Energy.

TABLE 4

TOTAL HIGHWAY TAX REVENUES,
SOUTHERN LEGISLATIVE CONFERENCE STATES
AND DISTRICT OF COLUMBIA,

1970-1980*

(In Thousnds of Dollars)

<u>Year</u>	<u>Amount</u>	<u>Year</u>	<u>Amount</u>
1970	3,307,910	1975	4,633,946
1971	3,617,319	1976	5,076,928
1972	4,088,438	1977	5,438,332
1973	4,535,009	1978	5,898,332
1974	4,503,089	1979	6,038,697
		1980 (Est.)**	6,016,100

*Source: Highway Statistics, U.S. Department of Transportation/Federal Highway Administration, Years 1970 through 1979, total of Tables MF-1 and MV-2.

**Source: Highway Statistics Division, Office of Highway Planning, Federal Highway Administration.

TABLE 5

STATE MOTOR FUELS TAX, VEHICLE REGISTRATION FEE, AND
MISCELLANEOUS FEE RECEIPTS, WITH PERCENT OF TOTAL,
SOUTHERN LEGISLATIVE CONFERENCE STATES AND D.C.

1970-1980*

(In Thousands of Dollars)

<u>Year</u>	<u>Motor Fuels Tax</u>	<u>% of Total</u>	<u>Registra- tion Fees</u>	<u>% of Total</u>	<u>Miscella- neous Fees</u>	<u>% of Total</u>
1970	2,146,753	64.90	728,704	22.03	432,453	13.07
1971	2,325,641	64.29	816,799	22.58	474,879	13.13
1972	2,628,366	64.29	838,197	20.50	621,875	15.21
1973	2,932,894	64.67	977,177	21.55	624,938	13.78
1974	2,860,680	63.53	1,025,664	22.78	616,745	13.70
1975	2,942,164	63.49	1,027,122	22.17	664,660	14.34
1976	3,130,420	61.66	1,115,735	21.98	830,773	16.36
1977	3,282,334	60.36	1,182,513	21.74	973,485	17.90
1978	3,460,054	58.66	1,303,114	22.09	1,135,164	19.25
1979	3,441,301	56.99	1,354,795	22.44	1,242,601	20.58
1980 (Est.)**	3,300,551	54.86	1,417,115	23.55	1,298,434	21.58

*Source: Highway Statistics, U.S. Department of Transportation/
Federal Highway Administration, Years 1970 through 1979, Tables MF-1
and MV-2.

**Source: Highway Statistics Division, Office of Highway Planning,
Federal Highway Administration.

TABLE 6

GASOLINE CONSUMPTION IN THE SOUTHERN LEGISLATIVE
CONFERENCE STATES AND DISTRICT OF COLUMBIA,

1970-1980*

(In Millions of Barrels Per Day)

<u>Year</u>	<u>Amount</u>	<u>Year</u>	<u>Amount</u>
1970	2.039	1975	2.544
1971	2.178	1976	2.698
1972	2.369	1977	2.818
1973	2.527	1978	2.953
1974	2.375	1979	2.907
		1980 (Prelim.)	2.784

*Source: Highway Statistics, U.S. Department of Transportation/
Federal Highway Administration, Years 1970 through 1979, Table MF-2.

TABLE 7

ESTIMATED STATE CONSUMPTION AND AVERAGE
PRICE OF "FULL SERVICE," REGULAR LEADED GASOLINE
IN THE UNITED STATES,

1981-1990*

<u>Year</u>	<u>Consumption</u> (Million Barrels/Day)	<u>Average Price</u> (Per Gallon)
1981	6.450	1.40
1982	6.419	1.56
1983	6.282	1.72
1984	6.072	1.91
1985	5.858	2.09
1986	5.647	2.29
1987	5.474	2.50
1988	5.307	2.74
1989	5.145	3.00
1990	4.987	3.29

*Source: Standard Oil of California, data furnished by
Bill Herman, Chief Economist, San Francisco, California.

III

MAXIMIZING THE PURCHASING POWER OF EXISTING RESOURCES

by Robert Fallon

Under conditions in which inflationary impacts on highway costs outstrip the annual growth in receipts from traditional road-user revenues, legislators in the South are faced with two options, if their states are to maintain previous levels of highway construction and maintenance.

The first option is to seek new taxes or increase rates for present tax sources, such as motor fuels, which are earmarked for highway activities. This option has been discussed in the preceding section of this report. The section which follows discusses the second option: maximizing the purchasing power of existing transportation resources by supplementing road-user revenue and by improving the efficient use and productivity of road-user dollars.

Information for this section covers the period from FY 1979 through FY 1981 and was derived primarily from telephone surveys with legislative and executive fiscal officers involved in transportation matters in fifteen southern states. Five other states outside the southern region, Iowa, New Mexico, Oregon, Maine, and Colorado, were also surveyed because of their initiatives in maximizing the purchasing power of existing transportation resources. (See Appendix.) In addition, recent reports on highway financing published by federal and state transportation agencies, as well as interest groups involved in highway financing, were reviewed. (See Bibliography.)

Supplementing Road-User Revenue

Despite variances among states on specific sources of dedicated taxes, all of the survey states, except for Georgia and Louisiana, earmark a specific source of revenue for highway activities. Receipts from road-user tax sources in both of these states are considered as part of General Fund revenues. Although supplemental revenue actions during the fiscal period 1979 through 1981 took different forms, the states' efforts may be categorized as follows:

- a) Appropriating or earmarking a portion of traditionally general revenue tax sources.
- b) Allocating the total share or a portion of Federal Revenue Sharing Funds received.
- c) Shifting the source of funding from road-user revenue to general revenues for selected items.
- d) Eliminating specific exemptions from road-user taxes.
- e) Issuing bonds for highway construction.

The survey indicated that only one of the fifteen states surveyed, North

Carolina, did not implement any of these supplemental funding measures during this three-year period.

As indicated in Figure I, the most popular supplemental funding approach has involved appropriating or earmarking a portion of traditionally general revenue tax sources. Twelve southern states, excluding South Carolina, Virginia and North Carolina, utilized this supplemental funding measure.

(Insert Figure One when possible)

Two of the five additional states surveyed utilized this supplemental funding approach. New Mexico increased annual highway funding by \$15 million when it earmarked the remaining 75% of its motor vehicle excise tax, previously part of that state's general revenue, for roads. In addition the 1980 Colorado legislature earmarked for highway purposes 6% of the proceeds from sales and use taxes on motor vehicles and related accessories. That action stipulates that each year the annual percentage of these receipts earmarked for highway activities will increase, up to 15% in 1986; it will mean an additional \$19.8 million in FY 1981 for highway activities in Colorado. Colorado also appropriated for FY 1981 \$60 million in surplus general revenues for state, county and municipal roads. State highways were allocated \$34.5 million of these funds for use in an expanded overlay program. The remaining \$25.5 million was allocated to county and municipal governments in the state.

The rationale for appropriating or earmarking a portion of general revenues for highway work is that the development and maintenance of an elaborate highway system is a contributing factor to a state's economic well-being. A state's economic strength is reflected in annual increases in the taxes connected with economic growth (sales, individual and corporate income taxes, property and occupational taxes). Since the development of an elaborate highway system contributes to the annual growth in these tax sources, the argument goes, a portion of those receipts should be appropriated or earmarked for highway activities. In a specific instance, it is often suggested that sales, or other general revenue tax sources, be utilized to finance highway bond debt service when it can be demonstrated that a road constructed with bond proceeds contributed to the economic enhancement of a particular region. The primary drawback to this funding measure is that unless a state has a substantial surplus or sufficient tax base to adequately fund other services financed with general revenues, funding needs for such programs as education or human services suffer.

The comments of most state officials concerning this supplemental funding approach focused on two main points:

- General revenue appropriation measures represented temporary solutions to the basic problem of insufficient tax base for highway purposes;
- Long-range planning of highway construction and maintenance activities is hampered by the fact that the amount and purposes for which annual supplemental General Fund appropriations can be expended is dependent upon the actions of state legislatures.

As Figure I indicates, the second most popular approach to supplementing road-user revenue is the use of proceeds of bond sales. Five of the fifteen states questioned, Georgia, Kentucky, Louisiana, Maryland and Virginia, sold such bonds during the period surveyed. West Virginia voters will decide on a \$750 million highway bond issue in the fall.

FIGURE 1

SUPPLEMENTAL REVENUE ACTIONS BY TYPE AND STATE
FY 1979-81

State	Appropriating or Earmarking General Revenues			Allocation of Federal Revenue Sharing Funds			Shifting of Funding Source for Road-User Financed Items			Issuing Bonds for Highway Construction			Elimination/Reduction of Road-User Tax Exemptions		
	FY79	FY80	FY81	FY79	FY80	FY81	FY79	FY80	FY81	FY79	FY80	FY81	FY79	FY80	FY81
Alabama 1/2	AL			AL											
Arkansas 3	AR	AR		AR	AR										
Florida 4	FL	FL													
Georgia 5/6	GA	GA	GA								GA				
Kentucky 7/8	KY	KY	KY					KY	KY	KY	KY	KY			
Louisiana 9	LA	LA	LA	LA	LA					LA	LA				
Maryland 10		MD									MD	MD			
Mississippi 11	MS														
North Carolina															
Oklahoma 12	OK	OK	OK												
South Carolina 13															
Texas 14	TX	TX	TX												
Tennessee 15	TN	TN	TN												
Virginia											VA				
West Virginia 16/17	WV	WV	WV	WV	WV	WV									

SUPPLEMENTAL REVENUE ACTIONS BY TYPE AND STATE
FY 1979-81

- 1/2 Supplemental actions include a \$3 million FY 79 General Fund appropriation and an \$11 million FY 79 allocation of Federal Revenue Sharing Funds, which financed highway operation and maintenance activities.
- 3 Supplemental actions include the earmarking of fees for driver records and investment income from construction balances and appropriation of General Funds for severe winter damages.
- 4 Supplemental actions are represented by the earmarking of 36.5% of motor vehicle license tax receipts, which generated \$75 million in FY 79 and a \$50 million one-time appropriation from surplus in FY 80.
- 5/6 Supplemental actions are represented by annual General Fund appropriations for highway activities in excess of road-user revenues collected in the preceding fiscal year, the earmarking of investment income on construction balances, which generated approximately \$35 million in FY 80, and \$24,750,000 in bonds sold in FY 81 for advanced interstate construction.
- 7/8 Supplemental actions include the earmarking of severance tax receipts for debt service on coal haul road highway bonds, appropriation of general revenues for coal haul and coal impact roads, and a shift in funding for enforcement of truck laws and highway research.
- 9 Supplemental actions include annual General Fund appropriations in excess of the road-user revenues estimates to be collected in a given FY.
- 10 Supplemental actions include the earmarking of 3 3/4% of the 7% corporate income tax and 1% of the 5% of the motor vehicle titling tax for highway activities. The actions generated \$27 million in FY 80.
- 11 Supplemental actions represent the earmarking of 78% of sales tax receipts on gasoline or motor fuels up to \$42 million annually. Program initiated in FY 79 for a two-year period and recently renewed.
- 12 Supplemental actions represent annual General Fund appropriations.
- 13 \$15 million is to be appropriated in FY 82 for matching federal aid.
- 14 Annual General Fund appropriations are financed through an omnibus tax clearance fund. When the fund was created in 1977, an annual revenue base for highways was set at \$750 million. Each year that base is increased by annual adjustments in a state-generated highway cost index, to create an optimal revenue level for highway activities. The difference between this optimal level of funding and annual receipts from road-user revenue sources is made up by appropriations from the fund.
- 15 Supplemental actions represent General Fund appropriations for bridge improvements, undesignated highway work, and supplemental pay increases.
- 16/17 Administrative tax agencies are to be funded from the General Fund in FY 82 and a \$750 million road bond issue is to be voted on in the fall.

The chief advantage of bond financing is that inflationary increases in construction costs can be avoided by the current funding of projects that otherwise would be delayed until sufficient federal and state revenue capacity would be available. The primary disadvantage is the long-term commitment of future road-user revenues to finance debt service and the extent to which such fixed obligations restrict the states' discretion in allocating resources for maintenance and construction needs.

Figure I indicates that four of the states surveyed, Alabama, Arkansas, Louisiana, and West Virginia, allocated all or a portion of their Federal Revenue Sharing Funds for roads.

Due to recent federal budget action, however, state governments are no longer eligible to participate in this program. It is anticipated that local governments will continue to receive Federal Revenue Sharing Funds; and supplementing local appropriations for highway capital improvements is one accepted usage of those dollars. The rationale for using federal money for such capital items as highways, is that they are a "one-time" expenditure, and any future funding cuts would not have the effect they would have on some regularly recurring expense (such as salaries).

Another means of supplementing road fund revenues employs the substituting (shifting) of general revenue support for such highway-related purposes as highway enforcement, planning/research, and administrative operations, some of which were formerly financed through road-user revenues. Only one state, Kentucky, utilized this approach. West Virginia is to shift the support for administrative tax agencies to general revenues in FY 1982. Of the five additional states surveyed, Oregon's voters effectively increased the annual outlays for its highways by \$30 million when a constitutional amendment, limiting expenditure of road-user revenues to highway activities, was adopted. Previously highway funds had been used to support a variety of activities in Oregon, including the state police and park system.

The rationale for this funding approach is that financing of these non-highway items with general revenues will purify the concept of road-user highway financing (discussed in Section 1). That concept states that road-users tax receipts, motor fuel taxes, and motor vehicles usage taxes should be utilized exclusively for the construction and maintenance of highways.

A serious limitation to the substitution funding approach is the same as that noted above in the discussion of appropriating or earmarking a portion of general revenues; i.e., a states' ability to substitute sufficient general revenues yet maintain or expand previous support for other vital state services.

The final means to supplement road-user revenue is to reduce or eliminate statutory exemptions from road-user taxes - for such items as motor fuels (including gasoline) used in boats, farm vehicles, or public transportation vehicles, and registration fees for certain classes of vehicles.

The rationale for this funding approach is again related to the road-user concept of highway financing; i.e., each highway user group should pay a total tax that corresponds to the total amount of highway costs that user group incurs on the highway system. The primary argument for maintaining or expanding road-user tax exemptions is that the individuals or organizations operating vehicles (farmers or public transportation agencies, for example) play a

major part in the social, economic, or public policy goals of that state and therefore their vehicles should receive a tax break on highway use.

Our survey indicated that the latter argument carried more weight during the period surveyed, since no state in the Southern region had reported any revisions to previous road-user tax exemptions and some states said that additional exemptions had been adopted. However, Iowa, one of the five additional states surveyed, during FY 1981, halved its total 10¢ exemption from road-user taxes for gasohol usage. This action, which calls for the total elimination of the gasohol exemption in 1983, is expected to generate an additional \$27 million for Iowa road activities over a five-year period.¹

Two additional reasons were cited by officials for the lack of state legislative action to alter present road-user tax exemptions.

- The existence of special interest groups which would be adversely affected by changes in present law; and
- The belief among many state legislators that removal of exemptions for activities previously not taxed is tantamount to approval of a tax increase.

Nevertheless, given the severe crisis in highway funding, it would appear that a close examination of statutory exemptions from road-user taxes in each individual state is warranted.

Efficient Use and Productivity of Road-User Dollars

State approaches to improving efficiency and productivity in expenditure of road-user dollars may be categorized as follows:

- 1) Operational - involving reduced activities and revised work processes;
- 2) Maintenance - instituting maintenance and equipment management programs; or
- 3) Construction - adopting FHWA guidelines for controlling construction costs or programming a greater percentage of construction dollars toward preservation of the existing highway system.

Operational

Seven southern states - Kentucky, West Virginia, Virginia, Florida, Alabama, South Carolina, and North Carolina - experienced what officials term "substantial reductions" in transportation operations in their states over the period surveyed. In addition, a majority of responses from other southern states stated that road-user expenditures were being closely monitored. Of the five additional states surveyed, Maine reduced \$16.7 million from its FY 1981 budget by a variety of administrative measures, including deferred initiation of certain highway improvements, cancellation of a highway bond sale to avoid debt service payments, and reduced appropriations for federal-aid matching and highway planning. Additional cutbacks in the state's resurfacing

program in FY 1983 are being contemplated, if a \$15.5 million requested supplemental general fund appropriation is not approved.

Reductions in highway programs in southern states were implemented to avoid a deficit in operations, or to apply a greater percentage of annual road-user resources to direct highway activities.

Examples of the reductions implemented, and some factors to consider, include:

- 1) Reduction in personnel by layoff and attrition - A large-scale reduction in the workforce may force the issuance of personal service contracts for maintenance and engineering work previously performed by state forces. Virginia is presently studying whether this alternative is more economical.
- 2) Decreased expenditure for:
 - a) public information - Reductions may adversely affect public awareness of highway activities.
 - b) aerial photography - Unless work is contracted or aerial mapping of the state is complete, reduction may hamper completion of highway engineering efforts.
 - c) planning/research - Reduction may hamper planning of long-range highway construction activities and delay implementation of cost-saving innovative highway construction and maintenance techniques.
 - d) salary expense for employee overtime - Reduction may prevent speedy completion of such highway maintenance activities as snow and ice removal, pothole patching, etc., causing inconvenience to motorists.
 - e) mowing - Reduction in this activity would be similar to limiting other maintenance activities not directly associated with the actual highway surface, such as guardrail replacement, street lighting, upkeep of rest areas, litter pickup, and snow and ice removal. These savings must be weighed against the decline in the appearance and safety of the total highway corridor and the added inconvenience to traveling motorists.
 - f) purchase of new equipment and supplies - Any savings from this measure may be temporary if equipment downtime and repair costs are increased and essential supplies are purchased "as needed," which often means higher costs.
- 3) The transfer of maintenance responsibility of certain highways to county and municipal governments, as discussed in Section 1 - This measure would reduce annual state expenditures for maintenance. However, shifting the burden of maintenance activities to county and municipal government without providing direct state aid, or authorization for those governments to increase existing or levy new taxes, does nothing to improve the overall condition of the state's highways.

- 4) Disposal of surplus state right-of-way and equipment - This action would reduce annual costs to maintain the equipment fleet and provide a one-time source of added revenues. Prior to declaration of right-of-way or equipment as surplus, however, a review should be undertaken to ensure that needed right-of-way for future projects and essential vehicle replacement parts for the remaining equipment fleet are retained.
- 5) Deferred initiation of federal-aid highway and maintenance activities - This reduction could be extremely costly in the future if reductions in highway reconstruction and preventive maintenance activities cause the further deterioration of the state's highways.

Maintenance

In order to improve efficiency in maintenance expenditure for the existing highway systems, all of the states surveyed have adopted some form of maintenance management program. Although state practices vary, all programs basically contain the following elements:

1. Implementation Phase:
 - a. Inventory of existing highway mileage by road type (interstate, primary, secondary);
 - b. Classification of individual maintenance activities into particular groupings (e.g., surfacing, ditching); and
 - c. Development of flexible statewide work standards involving personnel, materials, equipment, and time required for completion of each activity. These standards should be flexible enough to allow for regional variations in geography and traffic patterns.
2. Operation Phase:
 - a. Completed maintenance activities from the previous year are reviewed;
 - b. Based upon this review of completed activities, the current year's budget is prepared, to achieve the optimal level of a particular maintenance activity to be performed, such as ditching. For example, assume that a road within a district is to be ditched once every three years. After reviewing the ditching accomplished in the previous year, ditching needs for the upcoming year can be budgeted accordingly;²
 - c. The budgeted level of activity is subdivided into specific daily jobs;
 - d. Reported daily activities are compiled for future planning and programming.

Maintenance management programs allow for the bulk of maintenance work not of an emergency nature, such as road slides, or snow and ice removal, to be scheduled in advance.

Advocates of maintenance management programs contend that such programs are a way to quantify maintenance needs on an annual basis and result in completion of a greater amount of maintenance work with fewer personnel. The FHWA has also recommended maintenance management programs as a cost-saving measure.³ Critics maintain that advance planning of maintenance activities does not allow for highway departments to respond quickly to local requests for maintenance work that is not of an emergency nature.

With equipment costs accounting for 22% of total maintenance expenditures, the FHWA also recommends the development of a systematic equipment maintenance program, in conjunction with the implementation of maintenance management.⁴ The goal of equipment management programs is to enhance the process of making decisions regarding equipment replacement and repair by providing management the tools to evaluate present efforts in (1) equipment utilization; and (2) equipment maintenance. Savings in annual operating costs can be realized if improved management decisions result in increased utilization of existing equipment and reductions in equipment downtime, repair costs, and salaries for equipment maintenance personnel.

Equipment Utilization. The development and assessment of equipment rental rates, which offset the cost of operating and owning equipment, is the management tool utilized to evaluate equipment utilization.

The various costs of operating equipment (gas, oil, depreciation), are recovered through rental rates based on either the miles the vehicle is driven or the hours in use. In addition, minimum rental rates are developed which offset the inherent costs in owning equipment (e.g., storage and preventive maintenance), regardless of the time in use. These charges are assessed on a per month basis to the organizational unit assigned the equipment.

For instance, effective July 1, 1978, 2 1/2-ton to 3-ton dump trucks, used by the Kentucky Department of Transportation, were assessed a rental rate of \$.33 per mile or a minimum charge of \$265 per month.⁵ If the rental collected on usage was less than the minimum monthly rate, the organizational unit assigned the equipment was assessed the difference. If the rental charges exceeded the monthly minimum, the organizational unit was charged only the rentals collected on usage.

The assessment of rental rates assists state highway departments in improving equipment utilization in two ways. First, by a review of monthly rentals collected statewide on individual pieces of equipment, central office personnel can notice the underutilization and imbalance in equipment use among various regions of the state. Second, individual managers in various organizational units are given an incentive to dispose of underutilized equipment, since their operating budgets are being charged for equipment not in use.

Equipment Repair. Improved management decisions in the repair of equipment can be accomplished through the development of an Equipment Maintenance and Operations Cost System.

This system collects information on the direct costs related to equipment maintenance and repair, including labor, parts, and personnel required to complete each task. It then classifies equipment repair and maintenance work into a particular maintenance category (e.g., ditching, pothole patching) and job type (for instance, ditching a two-lane road in a particular region). Information generated by this system can be useful in making the following determinations:

- Whether additional preventive maintenance efforts prior to performing specific jobs would reduce the need for non-scheduled repairs.
- Whether it would be more economical to contract all or a portion of equipment maintenance work with commercial garages.
- Whether equipment maintenance personnel is adequately trained to accomplish needed repairs and efficiently utilized.

Construction

Highway construction costs have increased approximately 240% between 1970 and 1979.⁶ The FHWA has recently issued guidelines to states on measures to combat the spiraling costs of highway construction,⁷ which include:

- 1) Rejection of bids 7% over engineer's estimate, unless:
 - a) There was adequate bid competition.
 - b) The project is essential and deferring it would cause inconvenience to the public.
 - c) Readvertisement is likely to result in even higher bids.
 - d) The engineer's estimate is deemed unrealistically low.
- 2) Contract provisions which allow price adjustments during the life of the project for certain materials, such as steel, asphalt, portland cement, and petroleum. Price adjustment clauses set a certain base price for these materials and adjust those prices to reflect increases or decreases in the Produce Price Index. Such provisions are said to reduce contractor uncertainty over the future cost of these items and help hold down bid prices.
- 3) Reduction or elimination of retainage fees on contracts to improve the cash flow of contractors. Total construction costs are likely to be reduced by implementation of this measure, because the borrowing costs of contractors can thus be reduced. However, the purchaser's withholding of retainage fees is one method used to ensure that contractors will not neglect last-minute detail work on otherwise completed projects. Substantially reducing or eliminating these fees may delay the satisfactory completion of a project, causing inconvenience to the public.
- 4) Issuance of single-season contracts. Like measure #2, these contracts are designed to minimize the uncertainty of future price increases in the contractor's bid. Single-season contracts can be established by contracting large construction projects in stages or breaking these projects into smaller units, such as grade/drain and surfacing, for contracting purposes. Their use sometimes introduces the risk, however, of costs increasing because a contractor has pushed to meet a deadline.
- 5) Adoption of a formal, systematic approach to preconstruction activities (project development, design, right of way/utility relocation). The FHWA is currently developing a Preconstruction Engineering Man-

agement System, designed to aid states in more accurately predicting staffing needs and avoiding cost increases from delays in preconstruction activities.

- 6) Improving bid competition by extending the time periods for advertisement, carefully scheduling bid lettings to avoid overextension of the contracting industry, and eliminating prequalification requirements which may be "burdensome" to potential bidders. Even though bid competition will not ensure that construction costs will be lowered, project competition is considered a key element in any anti-inflation construction program.
- 7) Accepting input from contractors on cost-saving design and construction methods, either by utilizing Value Engineering (VE) in construction, or contract provisions which allow contractors to use alternative design and construction methods.

VE in construction involves:⁸

- Submission of written proposals by contractors to state highway departments, modifying the plans, specifications, etc., of a contract. The proposals should be aimed at reducing project cost without reducing the scope of the project.
- Provisions which stipulate that if the proposal is accepted by the department, the resulting net savings will be shared on a 50/50 basis between the contractor and the department.

Examples of value engineering proposals are:

- Proposing use of prestressed, stay-in-place bridge deck forms in lieu of corrugated or conventional steel.
- Proposing a redesign of the superstructure of a bridge, resulting in a significant decrease in the amount of steel and concrete used in the project.⁹

It is estimated that approximately fifteen states are presently utilizing value engineering clauses; other states are considering implementation of this technique. Table 1 is a summary of the experience of value engineering clauses in nine states. States not utilizing VE maintain that the increased paperwork and time involved in reviewing proposals is not justified by the benefits accrued. In lieu of VE, contractors should be provided the option of using alternative design and construction methods in order to reduce total construction costs. As in VE, the alternative methods should be reviewed to ensure that the quality of work and scope of the project is maintained.

- 8) Utilization, where possible, of recycled materials and waste products in bases and pavements. The contractor should make the determination of whether this proposal would be a cost savings. In some instances, the energy consumed in recycling the materials is greater than the cost of hauling and disposing of them.
- 9) Adoption of realistic proposals for granting time extensions when project delays are not the fault of the contractor. The rationale

here is similar to that behind measures #2 and #4; i.e., reducing the prospective contractor's uncertainty during the bidding stage.

A recent analysis by the FHWA has found that approximately 75% of the measures above have been adopted in the states.¹⁰ All of the above measures, judiciously used, generate cost savings, the FHWA noted.

Table 1
SUMMARY OF VE EXPERIENCE IN CONSTRUCTION -
SELECTED STATES*

State Highway/Transportation Department Using VEIC	Years Used	Savings Highlights
California	Since 1969	More than \$2 million during last five years
Minnesota	Since 1972	\$267,000 through 1979
Florida	Since 1976	Roughly \$500,000 per year
New Mexico	Since 1976	Approximately \$200,000 in first year
Virginia	Two years	Approximately \$1 million in two years
Alaska	One year	\$300,000 in first year
Georgia	Since 1977	Not available
Oregon	One year	Not available
Pennsylvania	One year	Estimate \$500,000 per year

*Table taken from FHWA memorandum, "Value Engineering Incentive Clauses," dated February 20, 1981, prepared by Associate Regional Administrator for Engineering and Operations, Atlanta, Georgia.

They point out, however, that reductions in program costs from #5, systematic preconstruction management, are more difficult to measure.¹¹

The final administrative option is to program a greater percentage of construction dollars toward resurfacing, restoration, and rehabilitation (3-R) projects than new construction. Due to variances among states in defining and reporting distinctions between construction and 3-R projects, it is not possible to identify the number of states where such a shift of emphasis has occurred lately. Nevertheless, the majority of states surveyed said that when available construction dollars are being programmed a higher priority is being placed on projects which would, in their estimation, enhance or preserve the existing highway system. With annual highway funding falling further behind inflationary increases, emphasis on such preservation is essential.

FOOTNOTES

1. Jennifer Stoffel and Charles Williams, "Rough Going for Road Funds," State Government News, March 1981, p. 7.

2. Highway Maintenance in Kentucky: An Overview, Legislative Research Commission, January 1980, p. 19.

3. Controlling Design, Construction and Maintenance Costs to Combat Inflation, U.S. Department of Transportation, Federal Highway Administration, p. 12.

4. Ibid.

5. Highway Maintenance in Kentucky, p. 31.

6. See Introduction.

7. Controlling Design, pp. 1-12.

8. Value Engineering Incentive Clause, U.S. Department of Transportation, Federal Highway Administration, February 20, 1981, p. 4.

9. Ibid., pp. 9-10.

10. An Assessment of FHWA's Anti-Inflation Program, U.S. Department of Transportation, Federal Highway Administration, November 14, 1980, p. 3.

11. Ibid., p. 4.

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- U.S. Department of Transportation, Federal Highway Administration Region 4, Value Engineering Incentive Clause. Atlanta, Georgia, February 20, 1981.

Appendix

SURVEY QUESTIONNAIRE

1. Does your State earmark specific sources of revenue for highway activities?
2. Has the State of _____ appropriated General Funds in FY 79 through FY 81 to supplement Road Fund revenues?
3. Has the State of _____ earmarked traditionally General Fund tax sources for highway activities in FY 79 through FY 81 to supplement Road Fund revenues?
4. Has the State of _____ sold bonds for highway construction in FY 79 through FY 81 to supplement available construction dollars?
5. Has the State of _____ from FY 79 through FY 81, either by legislative action or administrative decision, eliminated certain exemptions from Road Fund taxes such as for gasohol, boats or farm travel, etc.?
6. In order to supplement Road Fund revenues from FY 79 through FY 81 has the State of _____:
 - a. Increased or initiated tolls?
 - b. Appropriated a portion of severance taxes for highway activities?
 - c. Received investment income from construction balances for highway activities?
 - d. Allocated Federal Revenue Sharing Funds?
7. Has the State of _____ initiated any additional legislative or administrative actions during the FY 79 through FY 81 in order to supplement Road Fund revenues, excluding increases in, or initiation of, additional road-user taxes?
8. During the period FY 79 through FY 81, has the State of _____ shifted the source of funding from road user dollars to general revenues for such items as the highway patrol, administrative tax agencies, public transportation, etc. in order to provide greater resources for highway activities?
9. In your opinion, in order to provide greater resources for direct highway activities or to avoid a deficit in operations during the period FY 79 through FY 81, has the State of _____ made substantial reductions in non-highway road funded areas such as large scale layoffs in personnel or reductions in activities in planning/research, administration, etc.?
10. Does the State of _____ have a management program for highway maintenance activities? If so, briefly describe the system.
11. Has the State of _____ implemented the guidelines recommended by the Federal Highway Administration in order to hold down increases in highway construction costs, i.e., rejection of bids over 7% of engineer's estimate, price adjustment for selected materials, alternate design and con-

tracting procedures, value engineering clauses, single season contracts, extending advertising times, incentive/disincentive clauses, etc.?

12. Has the State of _____ shifted the focus during FY 79 through FY 81 in programming available construction dollars from new construction to resurfacing, rehabilitation, or reconstruction (3-R) work in order to preserve the existing highway system?

